Dialogic
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Dialogic® DSI Signaling Servers

SGW Mode User Manual

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Revision History

Date	Part Number	Issue	Description of Changes
August 2008	05-2305-005	5	Information updated to include the Dialogic ® DSI SS7G31 and SS7G32 Signaling Servers and licensing.
June 2008	05-2305-005-01	5-01	Trial release version. Information updated to include the Dialogic ® DSI SS7G31 and SS7G32 Signaling Servers and licensing.
September 2007	05-2304-004	4	Updates for brand changes, web sites, and other minor corrections.
December 2005	05-2304-003	3	Updates to include support for resilient IP connectivity, additional measurement and status commands (STSYP, MSSYP and MSEPP) and other minor enhancements and corrections.
May 2005	05-2304-001	2	Supports the first production release.
March 2005	05-2304-001-01	1	Field Trial release.

Note: The current issue of this guide can be found at:
http://www.dialogic.com/support/helpweb/signaling

Chapter 1: Overview

1.1 General Description

The Dialogic® DSI SS7G21, SS7G22, SS7G31 and SS7G32 Signaling Servers (hereafter, sometimes referred to as “Signaling Server(s)”), with an SGW Mode software license installed and enabled, operate as Dialogic® DSI Signaling Gateways (hereafter sometimes referred to as "Signaling Gateway(s)"). They provide an interface between SS7 and IP networks, allowing SS7 information to be carried over IP to either IP resident signaling points and applications (for example, a soft switch) or to another Signaling Gateway. IETF SIGTRAN protocols are used to help to ensure interoperability with third party equipment.

Each Signaling Server may be purchased as one of several equipment types. The SS7G21 and SS7G22 equipment types use the same chassis and operate with the same software, but use different signaling boards. The SS7G31 and SS7G32 equipment types use different chassis supporting different numbers of signaling boards, but use the same software. See Section 1.4, “Hardware Overview” on page 10 for a description of the Signaling Server hardware.

The Signaling Gateway uses the SIGTRAN M3UA protocol to "backhaul" SS7 signaling messages to IP resident Application Servers, removing the need for Application Hosts to have dedicated SS7 MTP services or hardware. Application Servers using the Signaling Gateway may be part of a single point code or multiple point codes.

The Signaling Gateway M3UA architecture uses open standards interfaces, providing flexibility, scalability and resilience. It is easy to add or reconfigure M3UA Application Servers and Signaling Gateways to address demands for new services or increased capacity.

The Signaling Gateway also supports SIGTRAN M2PA protocol to talk to other Point Codes over IP links, rather than TDM. M2PA may be used to connect within the central office, or for longhaul links over IP.

The SS7G21 and SS7G22 Signaling Servers are shipped in Signaling Unit Interface (SIU) Mode. To enable SGW functionality, order a SS7SBG20SGW license.

The SS7G31 and SS7G32 Signaling Servers are shipped in TEST Mode - without any operation mode license installed. To enable SGW functionality, order either a SS7SBG30SGWU,SS7SBG30SGWL or SS7SBG30SGWJ license. See Section 2.2, “Software Licenses” on page 18 for more information about the available licenses, and Section 3, “Licensing, Installation and Initial Configuration” on page 21 for information about license purchase, installation and operation.

A Signaling Server with the SGW Mode license installed and enabled is referred to as a “Signaling Gateway” throughout this manual.

The Signaling Server, if equipped with the SIU Mode software license, operates as a Signaling Interface Unit (SIU), providing an interface to SS7 networks for a number of distributed application platforms via TCP/IP LAN. In this mode, the unit implements the SS7 Message Transfer Part (MTP) and a number of User Parts (ISUP, SCCP, TCAP, MAP, IS41 and INAP). Refer to the *Dialogic® DSI Signaling Servers SIU Mode User Manual* for details of this operation mode.

The Signaling Server, if equipped with the DSC Mode software license, operates as a Digital Signaling Converter providing signaling conversion between pairs of network-side or access-side telephony protocols. Refer to the *Dialogic® SS7G21 and SS7G22 Signaling Servers DSC Mode User Manual* for details of this operation mode. DSC Mode operation is not available on the SS7G31 or SS7G32 products.

Refer to section Section 3, “Licensing, Installation and Initial Configuration” on page 21 for procedures about the purchase and installation of software option licenses. Refer to Chapter 3, “Licensing, Installation and Initial Configuration” on page 21 for procedures required to configure the Signaling Server for SGW Mode operation.

1.2 Related Information

This user manual, together with the *Dialogic® SS7G21 and SS7G22 Signaling Servers Hardware Manual* (05-2300-xxxx) and the *Dialogic® DSI SS7G31 and SS7G32 Signaling Servers Hardware Manual* (05-2630-xxxx) form the documentation set for the SGW mode of operation of a Signaling Server. These hardware manuals address hardware-specific aspects of the product including: installation, specification, module replacement and a full description of the hardware modules. This user manual describes the user interface, together with applicable parameters and configuration commands.

Current software and documentation supporting Dialogic® DSI Signaling Server products is available on the web at:
http://www.dialogic.com/support/helpweb/signaling.

The product data sheet is available at:
http://www.dialogic.com/support/helpweb/signaling.

For more information on Dialogic® SS7 products and solutions, visit:
http://www.dialogic.com/support/helpweb/signaling.

When used for M3UA backhaul operation, the Signaling Gateway may operate with an ASP operating either a Dialogic® M3UA Application Server or an Application Server provided by a third party vendor. See the *Dialogic® SS7 Protocols Programmer's Manual for SIGTRAN Host Software* for documentation on the configuration and use of a Dialogic® M3UA Application Server.

1.3 Applicability

This manual is applicable to SS7G21 and SS7G22 with software version 5.14 and SS7G31 and SS7G32 products with software version 1.00.

This manual is not applicable if the Signaling Server is operating as a Signaling Interface Unit (SIU) or as a DSC Protocol Converter (DSC). See the *Dialogic® DSI Signaling Server SIU Mode User Manual* and the *Dialogic® SS7G2x Signaling Server DSC Mode User Manual* for descriptions use of these modes of operation.

1.4 Hardware Overview

The Signaling Gateway may be purchased as one of the following equipment types:

- An SS7G21 is a 2U Signaling Server and may be purchased with one, two, or three Dialogic® DSI SPCI2S Network Interface Boards (where each board provides four SS7 links, two T1/E1 interfaces and two V.11 serial ports per board) or one, two or three Dialogic® DSI SPCI4 Boards (where each board provides four SS7 links and four T1/E1 interfaces per board).
- An SS7G22 is a 2U Signaling Server and may be purchased with one, two or three Dialogic® DSI SS7HDP Network Interface Boards (where each board provides 64 SS7 links and four T1/E1 interfaces per board) with a system maximum of 128 SS7 links.
- An SS7G31 is a 1U Signaling Server and may be purchased with one Dialogic® DSI SPCI4 Network Interface Board, (with 4 SS7 links and 4 T1/E1 interfaces), or one Dialogic® DSI SS7HDP Board, (with 64 SS7 links and 4 T1/E1 interfaces or 2 HSL links).
- An SS7G32 is a 2U Signaling Server and may be purchased with one, two or three SS7HDP Boards (with 64 links and 4 T1/E1 interfaces per board or 2 HSL links per board) with a system maximum of 192 LSL SS7 links or 6 HSL SS7 links.

When T1 or E1 is selected, the Signaling Gateway may be configured to pass the bearer channels from one PCM port to another, effectively "dropping out" the signaling in line.

The SS7G31 and SS7G32 support two hard disks configured as a RAID 1 array. Refer to Section 7.7, "Hard Disk Management" on page 146 for details. See Chapter 2, "Specification" for a definition of the capabilities of the system.

1.4.1 Part Numbers

For the SS7G21 and SS7G22 products, refer to the *Dialogic® SS7G21 and SS7G22 Signaling Servers Hardware Manual* for a list of the ordering codes and definitions of all of the hardware variants.

For the SS7G31 and SS7G32 products, refer to the *Dialogic® DSI SS7G31 and SS7G32 Signaling Servers Product Data Sheet* (navigate from http://www.dialogic.com/products/signalingip_ss7components/signaling_servers_and_gateways.htm) for a list of the ordering codes and definitions of the hardware variants.

1.5 Connectivity

TDM SS7 signaling can interface to the Signaling Gateway using balanced 1544 kbit/sec (T1) balanced connections in accordance with G.733 or 2048 kbit/sec (E1) connections in accordance with G.703. SS7 signaling can also be presented on a V.11 (56/64 kbit/sec) synchronous serial interface.

MP2A signaling used for communication between paired Signaling Gateways can be received at the conveter using 4 x 1 Gbit/sec RJ45 Ethernet interfaces.

1.6 User Interface

The Signaling Gateway provides serial port and telnet connections for configuration and management. All ports provide identical functionality and operate using text-based MML (Man Machine Language) commands in accordance with CCITT recommendations.

The serial and telnet ports allow you to configure the Signaling Gateway for operation and to carry out subsequent modifications to the configuration. They allow you to read the current status of the various signaling entities and to view the current active alarms and a history of past alarm events.

The Signaling Gateway provides two levels of SNMP support:

- Basic V1 SNMP functionality which uses the DK4032 MIB and reports counts of current alarms to an SNMP manager.
- Enhanced SNMP functionality which offers SNMP V1, V2c and V3 SNMP. Enhanced SNMP supports SNMP traps and event reporting using the DSMI MIB.

See Chapter 10, “Signaling Server SNMP” for more information.

The Signaling Gateway has alarm indicators on the front panel and alarm relays for connection to an integrated management system.

1.7 Configuration and Program Storage

All configuration data is stored on hard disk and is automatically recovered after system restart. Configuration data may optionally be backed up to a remote computer, previously backed-up configurations can be reloaded.

The SS7G31 and SS7G32 products include two hard disks configured in a RAID array. Refer to Section 7.7, “Hard Disk Management” on page 146 for details.

All operating software is stored on hard disk and is automatically initiated after system restart. The operating software can be updated either by reading a new software release from FTP, USB device or CDROM. In both cases, software update is initiated by MML command. See Section 4.11, “Updating System Software” on page 31 for details. Following a software update, the Signaling Gateway automatically uses the saved configuration data so that there is no need to reenter the configuration parameters.

1.8 IP Security

The Signaling Gateway offers a number of security features to protect it from unwarranted access on its IP interface. It is recommended that you always enable the optional password protection on the management interface port and on the FTP server port (if used).

For additional security, the Signaling Gateway is also equipped to support telnet and FTP access using a Secure Shell (SSH).

Unused ports are disabled to increase security against unintentional or malicious interference.

Additional security may be gained by separating management and signaling IP traffic. This can be achieved by configuring specific Ethernet ports for traffic and utilizing other Ethernet ports for system management.

It should be understood that while the Signaling Gateway has been designed with security in mind, it is recommended that Signaling Gateway accessibility over IP be restricted to as small a network as possible. If the unit is accessible by third parties, the use of a third-party firewall should be considered.

1.9 Functional Summary

The functional summary is described in the following topics:

- Signaling
- Configuration Model
- Cross Connections
- Monitoring
- Remote Data Centers
- Alarm Log
- Diagnostic Log Files
- M3UA Backhaul Operation
- M2PA Longhaul Operation
- Dual Operation
- Default Routing
- Resilience

1.9.1 Signaling

The Signaling Gateway supports the Message Transfer Part (MTP) in accordance with ITU Recommendations Q.700, Q.704 and Q.707 and ANSI operation in accordance with ANSI T1.111.

When a link set contains two or more signaling links, the Signaling Gateway supports load sharing and the full changeover and changeback procedures in accordance with ITU-T Q.704.

The Signaling Gateway supports up to 256 TDM SS7 signaling links allowing the Signaling Gateway to interface over TDM to a maximum of 64 other signaling points.

The Signaling Gateway supports up to 256 M2PA SS7 signaling links, allowing the Signaling Gateway to interface over IP to a maximum of 256 other signaling points.

The Signaling Gateway can have a presence in up to six separate IP subnets.

M2PA is supported in accordance with the IETF SS7 MTP2-User Peer-to-Peer Adaptation Layer specification.

SCTP is supported in accordance with IETF RFC 2960 and RFC 3309 Stream Control Transmission Protocol.

The Signaling Gateway supports communication with up to 256 Application Servers Processes (ASPs) for backhaul operation over M3UA.

M3UA is supported in accordance with the IETF RFC 3332 SS7 MTP3 User Adaptation Layer.

1.9.2 Configuration Model

MTP data messages are considered to arrive at either an MTP3 **link set** or an M3UA **SIGTRAN link**. The link set or M3UA SIGTRAN link identifies the network and SS7 format of the message. MTP3 link sets can exist above a TDM MTP2 signaling link or a signaling link utilizing a M2PA SIGTRAN link for communication over IP.

The decision as to how to process the data message is performed by the incoming route. The **incoming route** is identified by the network and domain (either MTP or IP) from which a message arrives.

The incoming route then determines whether the message requires further analysis of the data prior to destination selection by looking up a **routing key** table or whether a **destination** can immediately be selected.

If the Signaling Gateway determines that a routing key table be looked up, the data from the data message is compared with routing keys in a routing key table. If a match is found, and the destination for that routing key is in service, that destination is used. Otherwise, if the incoming route also has a destination associated with it, that default destination is used. If no routing key table is associated with it, the default destination is used.

A destination can route a data message to either an **Remote Application Server** (RAS) or to MTP (MTP over MTP2 or MTP over M2PA). Selection of whether MTP or IP routing is used is determined by the availability of the data messages point code in the MTP or IP domain and whether MTP or IP has priority.

If MTP routing is selected, the data message is sent out on an MTP **SS7 route** that matches the point code of the data message. It is possible to configure MTP3 with a default route for use when it is undesirable to preconfigure all routes that are used.

See Chapter 7, “Configuration Overview” for a more detailed configuration discussion and Chapter 11, “Worked Configuration Examples” for some examples.

1.9.3 Cross Connections

The Signaling Gateway allows you to set up cross connections (semi-permanent connections) between an incoming timeslot on one PCM port and an outgoing timeslot on any PCM port. These connections can either be simplex or duplex.

1.9.4 Monitoring

The Signaling Gateway allows you to monitor TDM signaling links by dropping a copy of the signaling to a spare PCM port. This allows for a protocol analyzer to be left connected to one PCM port and gives you the ability to control remotely which signaling links are monitored. Each monitored signaling link requires two timeslots on the spare PCM port, one to monitor the send direction and the other for the receive direction.

1.9.5 Remote Data Centers

The Signaling Gateway supports the transfer of software updates, configuration files, alarm reports and periodic measurements over Ethernet to/from a remote location, the Remote Data Center (RDC).

Multiple RDCs can be configured by specifying an IP address and a user name and password for the Signaling Gateway to use to “logon” to the RDC.

Data transfer to the RDC uses the File Transfer Protocol (FTP).

Measurement reports are made on a configurable periodic basis.

Optionally, since it can be configured as an FTP server, the Signaling Gateway itself can be configured to act as an RDC, thus allowing RDC operation to be performed locally on the Signaling Gateway itself.

See Chapter 9, “Remote Data Center Operation” for a more detailed description of the capabilities and configuration of an RDC.

1.9.6 Alarm Log

The Signaling Server is able to detect a number of events or alarm conditions relating to either the hardware or the operation of the protocols. Each alarm condition is assigned a severity/class (3 = Critical, 4 = Major, 5 = Minor) and a category and ID, which give more detail about the alarm. There are a number of mechanisms described below, by which these conditions can be communicated to management systems, and ultimately to the system operator (see Chapter 8, “Alarm Fault Code Listing” for a full list of alarm types, and their reporting parameters):

- Active alarms are indicated on the front panel of the Signaling Server, (except SS7G31), with three LEDs identifying severity; CRT, MJR, MNR.
- Active alarms may be indicated remotely from the Signaling Server, (except SS7G31), when the alarm relay outputs are connected to a remote management system.
- Alarm events, configuration changes and system status may be reported to an SNMP manager(s). Refer to Chapter 10, “Signaling Server SNMP”.
- A system operator can obtain a listing of the current alarm status (ID, class, fault title, occurrence time and title) using the ALLIP management terminal command described in Section 6.4.4, “ALLIP” on page 51.
- A system operator can access a log of the current and previous alarms using the ALLOP management terminal command described in Section 6.4.5, “ALLOP” on page 52. The Alarm Log has the capacity for up to 200 entries, each entry detailing the ID, title, alarm class, fault title, occurrence time, status (active or cleared), and cleared time (if appropriate). If a new fault occurs when the log is full, the oldest entry that is either cleared, of lower class, or equal class is overwritten, in that order of preference. The operator may request a display of the log at any time and may remove entries that have cleared status.
- The alarm log may also be reported to a Remote Data Center (RDC). See Section 9, “Remote Data Center Operation” on page 153 for the configuration and operation of an RDC and for the format of the alarm log records.

1.9.7 Diagnostic Log Files

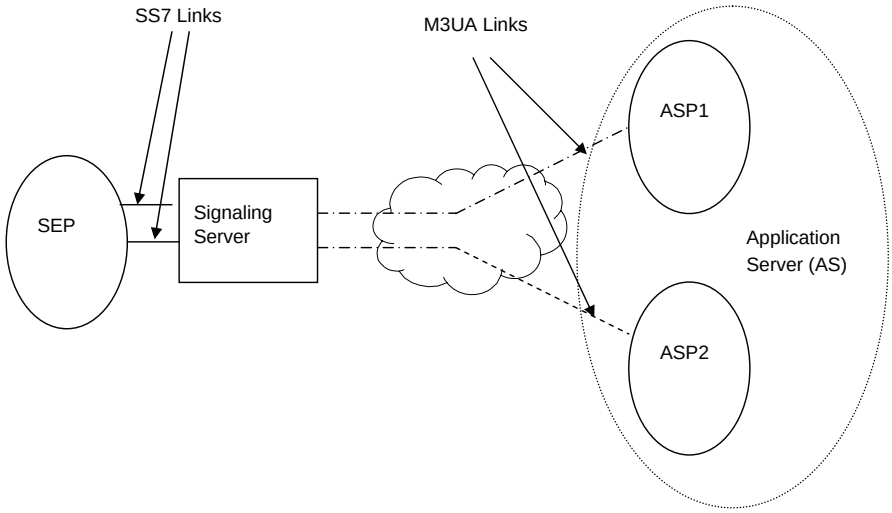
Upon restart, the Signaling Server generates a number of diagnostic files. These files may aid the support channel in the analysis of severe errors, such as an unexpected system restart or particular alarms. The text files, **restart_gct.log**, **restart_top.log**, **restart_sensor.log**, **restart_ip.log** and **restart_disk.log** can be recovered from the syslog directory using FTP protocol as described below.

```
ftp 123.123.123.123
user siuftp
password siuftp (or the ftppwd as set by the CNSYS command)
cd syslog
ascii
get restart_gct.log
get restart_top.log
get restart_sensor.log
get restart_ip.log
get restart_disk.log
bye
```

1.9.8 M3UA Backhaul Operation

The Signaling Gateway can use the SIGTRAN protocol M3UA to “backhaul” SS7 information to an IP resident Remote Application Server (RAS) operating on one or more Application Server Processes (ASPs). Examples of Application Servers are Media Gateway Controllers or IP resident databases. In both cases, the Application Server can operate as a Signaling End Point (SEP), where SS7 User Part Protocols, such as SCCP or ISUP, operate above a M3UA layer on the host.

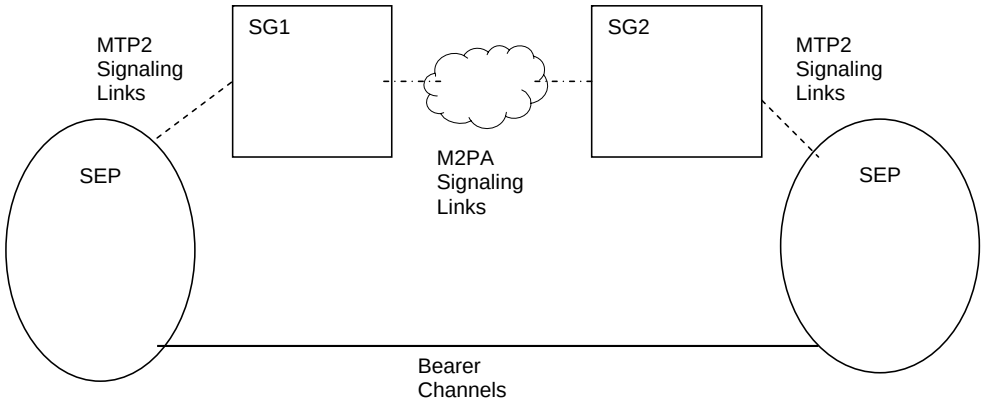
Figure 1. M3UA Backhaul Configuration



1.9.9 M2PA Longhaul Operation

The Signaling Gateway is capable of replacing TDM SS7 links with signaling links operating over IP, providing the equivalent functionality to MTP Layer 2 by using the SIGTRAN M2PA protocol. One use of M2PA signaling links would be for the low cost longhaul of signaling traffic possibly involving SS7/SS7 protocol conversion. Two Signaling Gateways would be required, one either side of the IP connection translating between M2PA <-< MTP2. See Chapter 11, “Worked Configuration Examples” for an M2PA Longhaul configuration example.

Figure 2. M2PA Longhaul Configuration



1.9.10 Default Routing

The Signaling Gateway may be configured to use default routing. This is designed to allow greater routing flexibility. See Section 6.5, “Configuration Commands” on page 55 for further information regarding default routing.

1.9.11 Resilience

1.9.11.1 IP Resilience

The Signaling Servers support up to 6 IP ports. These ports may be configured with IP addresses in separate IP networks to allow greater IP resilience on the Signaling Gateway. IP addresses are configured using the IPEPS command, while the IPGWI command allows you to configure the default IP gateway for the unit or additional gateways.

As the Signaling Gateway supports static, rather than dynamic IP routing, the Signaling Gateway may not be configured with different IP addresses within the same IP network. Instead, resilience between two IP ports within the same network can be achieved by using IP port bonding, which allows two physical IP ports to be bonded together in an active/standby configuration under a single IP address. See Section 7.6.1, “IP Port Bonding” on page 143 for more information.

1.9.11.2 Dual Operation

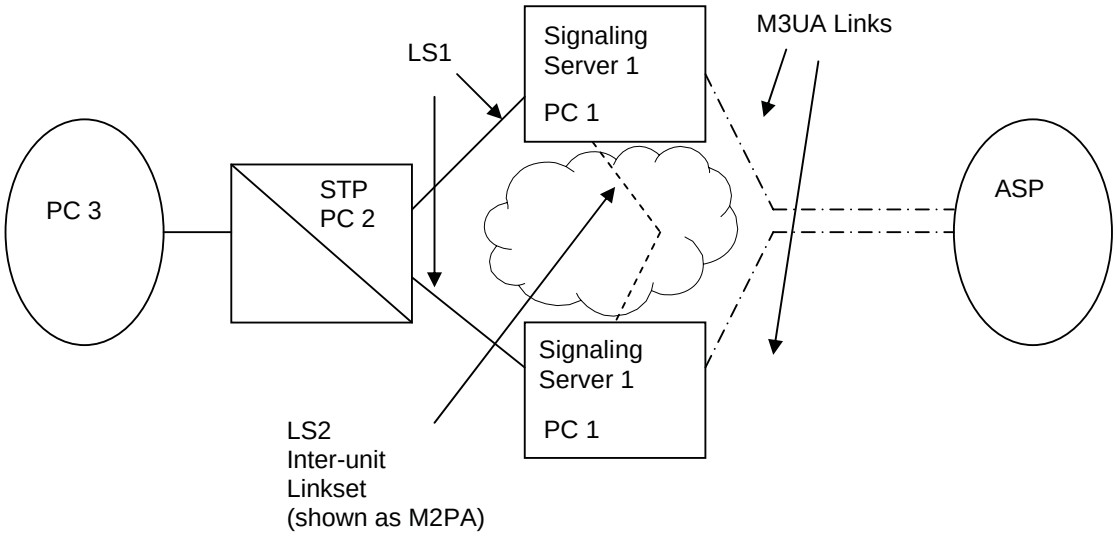
The Signaling Gateway may be configured as part of a Dual-Resilient pair; that is, two Signaling Server units appearing to the network as a single point code. If the SS7 network loses accessibility of one unit, the point code status remains unaffected.

Figure 3 shows a dual resilient system with two Signaling Server products connected to an STP in the SS7 network and an M3UA ASP. To achieve this configuration, the following additions to the normal configuration must be made:

1. The configuration of an inter-unit link set. This has the same DPC and OPC. This link set may consist of MTP2 links, M2PA links or a combination of both.
2. Each C7Route must be configured to use a preferred link set LS1 and a backup link set LS2.
3. Each Signaling Server must be configured with a C7Route to the other Signaling Server using only LS2.

Note: Since both units have C7Links that are part of the same link set (from the perspective of the adjacent point code), care must be taken in the assignment of SLCs.

Figure 3. Dual Resilient Configuration



See Chapter 7, “Configuration Overview” for a more in depth discussion of Dual Resilient configuration.

Chapter 2: Specification

2.1 Hardware Specification

Details of the Signaling Gateway hardware specification are given in the *Dialogic® SS7G21 and SS7G22 Signaling Servers Hardware Manual* and the *Dialogic® DSI SS7G31 and SS7G32 Signaling Servers Hardware Manual*.

The Dialogic® DSI SS7G31, SS7G32, SS7G21 and SS7G22 Signaling Servers physically identify Ethernet ports in different ways. Below is a mapping between the Ethernet ports as it is identified in software, and the physical port as it is identified in its respective Hardware Manual:

Dialogic® DSI SS7G21 and SS7G22 Signaling Servers

Ethernet ports number in the range 1 to 4, where:

- ETH=1 corresponds to physical port ENET 1.

- ETH=2 corresponds to physical port ENET 2.

- ETH=3 corresponds to physical port ENET LNK A.

- ETH=4 corresponds to physical port ENET LNK B.

Dialogic® DSI SS7G31 Signaling Servers

Ethernet ports number in the range 1 to 4, where:

- ETH=1 corresponds to physical port 1.

- ETH=2 corresponds to physical port 2.

- ETH=3 corresponds to physical port 3.

- ETH=4 corresponds to physical port 4.

Dialogic® DSI SS7G32S Signaling Servers

Ethernet ports number in the range 1 to 6, where:

- ETH=1 corresponds to physical port 1.

- ETH=2 corresponds to physical port 2.

- ETH=3 corresponds to physical port ACT/LNK A (bottom).

- ETH=4 corresponds to physical port ACT/LNK B (bottom).

- ETH=5 corresponds to physical port ACT/LNK A (top).

- ETH=6 corresponds to physical port ACT/LNK B (top).

2.2 Software Licenses

This section identifies which licensable capabilities can be purchased for Signaling Server SGW Mode operation.

For information relating to the purchase, installation and activation of software licenses, see Chapter 3, “Licensing, Installation and Initial Configuration”.

2.2.1 Software Licenses for the SS7G31 and SS7G32 Signaling Servers

The following SS7G30 licenses can be purchased for SGW mode.

Item Market Name	Description
SS7SBG30SGWU	16 MTP links, 16 M3UA links, 16 M2PA links. Up to 154 Kilobytes/sec throughput on SIGTRAN links - equivalent to 16 Low speed TDM links at 0.6 Erlangs. Includes DSMI SNMP
SS7SBG30SGWL	64 MTP links, 64 M3UA links, 64 M2PA links. Up to 615 Kilobytes/sec throughput on SIGTRAN links - equivalent to 64 Low speed TDM links at 0.6 Erlangs. Includes DSMI SNMP
SS7SBG30SGWJ	192 MTP links, 256 M3UA links, 256 M2PA links. Up to 2460 Kilobytes/sec throughput on SIGTRAN links - equivalent to 256 Low speed TDM links at 0.6 Erlangs. Includes DSMI SNMP
Throughput limit on a SGW license is available to either M3UA or M2PA. If both M3UA and M2PA are configured, then the available throughout allowance will be shared between the protocols such that the combined throughput does not exceed that which is specified by the license.	

2.2.2 Software Licenses for the SS7G21 and SS7G22 Signaling Servers

The following SS7G20 licenses can be purchased for SGW mode.

Item Market Name	Description
SS7SBG20SGW	Enable SGW functionality supporting up to 200 M3UA links
SS7SBG20M2PA	32 M2PA links

2.3 Capabilities

This section identifies key capabilities of the Signaling Server. The capabilities of a Signaling Server is dependent on the number and type of signaling boards installed as defined by the product variant as well as which software licenses installed.

Use of Signaling Servers in dual pairs increases the capacity of the overall system while still acting as a single SS7 point code. The numbers given in this section are for a single Signaling Server.

2.3.1 Dialogic® DSI SS7G31 and SS7G32 Signaling Servers Protocol Capabilities

Feature or Protocol	SS7G31 Capabilities	SS7G32 Capabilities
Dialogic® DSI Network Interface Boards	Up to 1 SPCI4 board or up to 1 SS7HDP board	Up to 3 SS7DHP boards or up to 3 SPCI4 boards
Portable Media Device	USB	USB
PCM per board	4 per SPCI4 or 4 per SS7HDP	4 per SS7HDP or 4 per SPCI4
V.11 ports per board	none	none
Ethernet interface	4	6
SS7 links per board	4 per SPCI4 or 64 per SS7HDP	4 per SPCI4 or 64 per SS7HDP
HSL links per board	2 per SS7HDP	2
M3UA links	256	256
M2PA links	256	256
SS7 linksets	64	64
SS7 links	256	256
SS7 routes	4096	4096

Feature or Protocol	SS7G31 Capabilities	SS7G32 Capabilities
Remote application servers	256	256
M3UA routes	256	256
Network contexts	4	4

2.3.2 Dialogic® DSI SS7G21 and SS7G22 Signaling Server Protocol Capabilities

Feature or Protocol	SS7G21 Capabilities	SS7G22 Capabilities
Network Interface Boards	Up to 3 Dialogic® DSI SPCI2S boards or up to 3 Dialogic® DSI SPCI4 boards	Up to 3 Dialogic® DSI SS7HDP boards
Portable Media Device	CDROM	CDROM
PCM per board	2 per SPCI2S or 4 per SPCI4	4 per SS7HDP
V.11 ports per board	2 per SPCI2S	none
Ethernet interface	4	4
SS7 links per board	4 per SPCI2S or 4 per SPCI4	64 per SS7HDP
HSL links per board	none	2 per SS7HDP
M3UA links	200	200
M2PA links	32	32
SS7 linksets	64	64
SS7 links	128	128
SS7 routes	4096	4096
Remote application servers	200	200
M3UA routes	200	200
Network contexts	4	4

Chapter 3: Licensing, Installation and Initial Configuration

3.1 Software Licensing

Functional capabilities and signaling protocols are activated on the Signaling Server through the use of software licenses. The following section provides information on the purchase of software licenses as well as information relating to temporary operation of the Signaling Server without software licenses.

The full set of software licenses supported on the Signaling Server for SIU mode are identified in Section 2.2, “Software Licenses” on page 18.

3.1.1 Purchasing Software Licenses

You should place an order using your normal sales channel, quoting the *item market name* for the software option required.

At this point in the process, there is no need to know details of the specific Signaling Server on which the option is to be installed (the target Signaling Server).

The order ships through the normal supply channels and you receive a paper *License Certificate*. The certificate contains the full license terms for using the Signaling Server software option and a unique *License ID* that is needed to activate the license.

When the License Certificate is received, you should first read the full terms of the software license:

- If you do not agree with the software license terms, you must contact your sales channel for a refund and must not activate the software license.
- If you agree to the software license terms, you can continue with the process following.

The next stage is to identify the Signaling Server on which the software option is to be activated. To do this, it is necessary to obtain the UNIT ID for the Signaling Server, which is obtained by executing the CNSYP MML command on the target Signaling Server.

Once you have the License ID and the UNIT ID, the license can be activated on the Signaling Server. *License Activation* is the process of submitting the License ID and UNIT ID so that a *License File* can be generated and sent for installation on the target Signaling Server.

The License Activation process is web-based and the License File is sent by email.
You perform License Activation by visiting the web site:
http://membersresource.dialogic.com/ss7/license/license.asp (or an alternative URL if listed on the License Certificate).

You are asked to provide the following basic information:

- Name
- Company
- Country
- Email address (this is used to send the License File)

You are then asked for the following information about the Signaling Server:

- Operating System - Enter “Signaling Server”.
- Host ID - Enter the UNIT ID.
- User Machine Identification (a string, typically the Signaling Gateway name, used by you to identify the Signaling Server).

You must list the License ID (taken from the License Certificate) for each protocol that is to be licensed on the target Signaling Server.

Once all this information has been entered, the form should be submitted. You receive confirmation that their request has been submitted. Subsequently, you receive your License File by email.

3.1.2 Temporary Licenses

A temporary software license can be issued for a spare or backup signaling server in the event that an existing server encounters a problem that requires the unit to be repaired or replaced. Alternatively, a new permanent license, based on the licenses from the failed unit, can be issued for a spare signaling server.

The process for obtaining a temporary license file is almost identical to that of activating a new license. On the web based activation form, the License IDs should be prefixed with the following 4 characters: **BAK-**.

For example, if the license ID on the certificate is **G20-ISUP-785-9187**, the license ID specified on the web form for the corresponding temporary license would be **BAK-G20-ISUP-785-9187**. The Host ID entered on the form is that of the replacement system on which the license will be installed.

A temporary license file will be sent to the email address you specify during license activation. A temporary license will allow operation of a spare/backup unit for a period of 30 days from date of issue, after which it will be impossible to restart the system software.

3.2 Installing the Signaling Gateway

Caution: The Signaling Gateway should only be installed by suitably qualified service personnel. Important safety and technical details, required for installation, are given in the *Dialogic® SS7G21 and SS7G22 Signaling Servers Hardware Manual* and the *Dialogic® DSI SS7G31 and SS7G32 Signaling Servers Hardware Manual*.

In order to complete the installation of the Signaling Gateway unit, follow the steps below:

1. Connect a VT100 terminal to the unit (see Section 3.2.1).
2. Set the IP addresses of the unit (see Section 3.2.2).
3. Download software from the Dialogic website (see Section 3.2.3).
4. Install any additional software option licenses that may have been purchased (see Section 3.2.4 and Section 3.2.5).
5. Change the system type to act as a SIGTRAN Signaling Gateway (see Section 3.2.6).
6. Apply the configuration to the unit (see Section 3.2.7).

3.2.1 Connecting a VT100 Terminal

A VT100 compatible terminal can be connected, using a DKL29 cable, to the serial port (COM2) on the rear of the unit. After pressing the carriage return (Enter) key, the Signaling Gateway interface prompt is displayed. Default serial port settings are 9600 baud, 8 data bits, 1 stop bits and no parity bits.

The output on the VT100 screen is similar to one of the following:

```
SS7G20(SIU) logged on at 2004-01-20 14:52:29
<
```

to indicate SIU operation

OR

```
SS7G20(SGW) logged on at 2004-01-20 14:52:29
<
```

to indicate SGW operation

OR

```
SS7G20(DSC) logged on at 2004-01-20 14:52:29
<
```

to indicate DSC operation.

3.2.2 IP Configuration

The Signaling Gateway is configured with a default IP address of 192.168.0.1. If this address is not unique, or not suitable for the existing network configuration, it is necessary to change this value to a unique IP address in the Ethernet network to which it is connected. Instructions for making this change are given below.

Using the VT100-compatible terminal, the IP address is set by entering the system configuration command, IPEPS. For example, to set the IP address to 123.124.125.126, the following command should be entered:

```
IPEPS:ETH=1,IPADDR=123.124.124.126;
```

It is also possible to configure a subnet mask if the unit is a member of a subnet. The default subnet mask is 255.255.255.0. To set the subnet mask to a different value, the following command should be used (the example here sets a subnet mask of 255.255.255.192):

```
IPEPS:ETH=1,SUBNET=255.255.255.192;
```

The management interface also allows an IP default gateway address to be specified using the GATEWAY parameter on the IPGWx command (see Section 6.7, “IP Commands” on page 86).

This is set by default to 0.0.0.0, indicating that no default gateway is present. For example, to set the gateway address to 123.124.125.250, the following command is used:

```
IPGWI:IPGW=DEFAULT,GATEWAY=123.124.124.250;
```

The current settings can be displayed by entering the IPEPP and the IPGWP command.

After changes using the IPEPS or IPGWI commands new IP parameters are initialized *with immediate effect*. If the IP address used to login to the unit for the telnet session is changed, you are automatically logged out of the session. However, you can log in again without delay using the new IP address.

The Ethernet connection should be verified by attempting to “ping” the SGW from a computer connected to the same Ethernet network, using the following command:

```
ping 123.124.125.126
```

If the Signaling Gateway has been configured correctly, it responds to the ping and the host machine displays a message confirming communication with the Signaling Gateway (the exact format and response of this message is operating system dependant).

If ping fails, you should check that the IP address was entered correctly and that there is no fault with the cabling to the Signaling Gateway.

Once the ping command shows that the Ethernet connection is valid, it should be possible to access the management interface previously used on the VT100 compatible terminal via telnet. This is achieved by establishing a telnet session to port 8100 or 8101.

Note: It is not possible to telnet to the standard telnet port 23.

For example, on a typical host console, the following command starts a telnet session to a Signaling Gateway with an IP address of 123.124.125.126:

```
telnet 123.124.125.126 8100
```

The telnet terminal displays the MML interface prompt:

```
SS7G20(SGW) logged on at 2004-01-20 14:52:29
<
```

An optional password can be set to control remote access to the MML. This is done using the CNSYS command:

```
CNSYS:PASSWORD=password,CONFIRM=password;
```

If set, a user opening a telnet session to the MML is prompted to enter a password, for example:

```
SS7G20(SGW) logged on at 2004-01-20 14:52:29

password:
```

Password access can be removed by specifying “null” values for the PASSWORD and CONFIRM parameters, that is:

```
CNSYS:PASSWORD=,CONFIRM=;
```

For additional security, the units support the use of Secure Shell (SSH) tunnelling for telnet and secure FTP operation. The user should use the CNSYS command to restrict telnet access to "telnet via SSH tunnelling" only. For example:

```
CNSYS:SECURE=Y;
```

Note: The unit does not provide a Secure Shell session connection. Your SSH client may need additional configuration to allow SSH tunnelling without a session connection.

Once activated, a future user is required to set up an SSH tunnel prior to telnet access. For a client on a Linux or Solaris like operating system, login for telnet using the ssh application. The ssh application should be invoked using a shellscript of the following form:

```
#!/bin/sh
ssh -l siuftp -C -f $1 -L 2323:$1:8101 sleep 5
telnet localhost 2323
```

3.2.3 Software Download

Current information and software downloads for the Dialogic® DSI Signaling Server products can be found at the following URL:
http://www.dialogic.com/support/helpweb/signaling

The product leaves the factory with fully-functional software installed. We recommend you check the above URL for any recent revisions, and install them before putting the product into service.

Since it is possible to source units from multiple supply channels, we recommend that each is checked to verify that all units in a delivery are at the same software revision.

Follow the steps below:

1. Check the current software version running in the system using the CNSWP command.
2. Check the latest distribution file from the “Signaling Gateway” section on the SS7 Products download web site:
   http://www.dialogic.com/support/helpweb/signaling
3. If a download is required, store the distribution file in an empty directory on the hard drive of the downloading machine.
4. Follow the steps detailed in Section 4.11, “Updating System Software” on page 31 in order to carry out the update of the system software.

3.2.4 Installing Software Licenses

This section describes how additional licenses are installed on the Signaling Server. Each Signaling Server is licensed to run specific components of the protocol stack. The STLCP command provides a printout that shows which components are licensed on a particular unit. Each unit is uniquely identified by a unit identity value, which is displayed as the UNITID parameter in the CNSYP command output.

The License File, purchased as described in this chapter, is a simple text file. The contents of the file are similar to the following:

```
FEATURE SGW_U_G30 dialogic 1.000 permanent uncounted \
HOSTID=000e0de513c4  SIGN="00ED 17C4 1197 F91E E36F D5F5 9371 \
1600 2CC9 8AF4 82C9 3AF5 F1C6 9329 B5CD"
```

Normal operation of the license update procedure uses MML to update the system's purchasable licenses with the file taken directly from a Remote Data Center (RDC).

The procedure to install licenses from system start is as follows:

1. Rename the purchased license file to sgw.lic.
2. Establish an FTP session (see Section 4.9, "FTP Access" on page 30).
3. Set the FTP transfer mode to "ASCII", since the license file is a text file.
4. Transfer the software license to the Signaling Gateway by typing the command "put sgw.lic sgw.lic".

   Note: The Signaling Gateway uses a case-sensitive file system. Therefore, it is necessary to specify sgw.lic in lowercase.
5. Terminate the FTP session by entering "quit" or "bye".
6. Establish an MML session and restart the unit by typing the following command:

   ```
   MNRSI:RESTART=SOFT,SYSTYPE=SGW;
   ```

   The machine then boots and completes the upgrade. Once the upgrade is complete, the machine is accessible via MML.
7. Check the licenses using the STLCP command.

   Note: If the licensing upgrade fails, the unit restores the previous licensing level.

3.2.5 License Update from Remote Data Center

The procedure to perform a license update from the a Remote Data Center (RDC) is as follows:

1. The user should enter:

   ```
   CNUPI:DTYPE=LICENSE,RDC=<rdc id>,DIRECTORY=<subdirectory>;
   ```

   to request that the license be updated from a RDC where the license file is stored in a subdirectory in the ftproot.
2. Once you have confirmed that the license should be updated, the license file is transferred to the Signaling Gateway without further interaction with the user. The unit indicates that the file has been successfully transferred by displaying the "EXECUTED" response to the CNUPI command.
3. Establish an MML session and restart the unit by typing the following command:

   ```
   MNRSI:RESTART=SOFT;
   ```

   The machine then boots and completes the upgrade. Once the upgrade is complete, the machine is accessible via MML.
4. Check the licenses using the STLCP command.

3.2.6 Changing System Operation Mode

By default, the Signaling Gateway is shipped configured to operate in TEST mode. Once an SGW license has been applied, the system must be restarted using the MNRSI MML command requesting that the unit operate in SGW mode. Connect a VT100 terminal to identify the mode of operation (See Section 3.2.1, “Connecting a VT100 Terminal” on page 22).

The MNRSI restart command should be used to restart the system in a different mode. MNRSI should be used together with the mode in which the Signaling Gateway is expected to operate in after restart. For SGW operation this is:

```
MNRSI:RESTART=SOFT,SYSTYPE=SGW;
```

3.2.7 Configuration Procedure

Once the system architecture and protocol configuration is known, it is necessary to set this configuration within the Signaling Gateway. Configuration is achieved using MML commands as described in Chapter 6, “Command Definitions”. An overview of configuration is provided in Chapter 7, “Configuration Overview” and example configurations are described in Chapter 11, “Worked Configuration Examples”.

Chapter 4: Operation

4.1 General

The Signaling Gateway can be configured from either serial port 2 (COM2, on the rear panel) or by using telnet over the Ethernet interface. The serial port can be configured over a range of baud rates and parity. The default configuration for the port is 9600 bits/s, 8 data bits, 1 stop bit, and no parity. Serial port 1 (COM1, on the front panel) is not supported on the Signaling Server. Flow control can be set to either NONE or XON/XOFF on the terminal used to communicate with the serial interface of the Signaling Server.

The commands that make up the Signaling Gateway Man-Machine Interface Language (MML) are based on the CCITT blue book recommendations Z.311 to Z.317.

In the following description, input text, numerals and characters that you are expected to enter are shown in **bold text** and responses displayed on the screen are shown in fixed width text. Syntax elements that are further defined are shown in angle brackets, for example, <time of day>.

4.2 Log On/Off Procedure

To initiate a dialog with the Signaling Gateway, the operator must “log on” to one of the MML interfaces.

To log on to the serial port when it is configured to use DTR/DSR, the connected terminal should assert DSR. The Signaling Gateway asserts DTR in response and you can then enter into a dialog with the Signaling Gateway. The session is ended by operator command to the Signaling Gateway, or by the terminal deasserting DSR or at the expiry of an auto log off timer. The Signaling Gateway deasserts DTR in response to any one of these three. To log on again, DSR must first be deasserted.

To log on to the serial port when it is not configured to use DTR/DSR, the carriage return key should be entered. The session is ended by operator command to the Signaling Gateway or at the expiry of an auto log off timer.

The two telnet connections provided are accessed using a standard telnet utility. Only ports 8100 and 8101 can be used. The default port 23 should **not** be used.

If a password is specified for the system, when logging on, the password is required before being allowed to continue. If an incorrect password is entered, the system again prompts for a password. If an incorrect password is entered three times, the port is disconnected. For safety, the password is never required on the serial port.

When the connection is established, a message consisting of the system identity followed by:

```
logged on at <calendar date> <time of day>
```

is displayed, followed by the command prompt, which is the less than symbol (<). The logon session is ended either by operator command or at the end of an auto log off time out.

The system maintains two timers during the log on session: an “auto log off warning” timer and a “auto log off” timer. Both are restarted each time a new command is input. When the auto log off warning time out expires, an auto log off warning message is output to the terminal and any partially entered command is discarded. The system then outputs a command prompt to the terminal. If no command is input before the auto log off time out expires, the log on session is ended. The duration of both these timers is user-configurable and can even be disabled completely.

When log off is initiated, a message consisting of the system identity followed by:

```
logged off at <calendar date> <time of day>
```

is output to the operator’s terminal. The Signaling Gateway then initiates the appropriate procedure to end the connection to the operator’s terminal.

4.3 Command Character Set and Syntax

The only characters used for commands and parameters are:

- The letters **A** to **Z** and **a** to **z**, referred to as <letter>. The case of characters in command names and parameter names is not significant.
- The digits **0** to **9**, referred to as <digit>
- - (hyphen), CR (FE5), SP (space), **$**(dollar), **&** (ampersand), ***** (asterisk), **:** (colon), **;** (semicolon) **/** (solidus), **.** (full stop/period) and **=** (equals sign)
- The DEL (Delete) character or the BS (Backspace) character is used to delete characters on the current line.
- The CAN character (Ctrl X) is used as an abort character.

It is possible to indicate several simple values for the same parameter by grouping parameter arguments using the operators **&** or **&&**. For example, **3&6** indicates the simple parameter arguments 3 and 6. A sequence of consecutive simple parameter arguments is indicated by writing the lower and upper simple parameter arguments separated by **&&**, hence **4&&8** indicates the simple parameter arguments 4, 5, 6, 7 and 8.

Comments are allowed in command input, and can appear in any position on the command line. A comment is defined as a character string enclosed between the separators **/*** (solidus asterisk) and ***/** (asterisk solidus), where the character string can contain any characters except the format effector characters (HT – Horizontal Tab, LF – Line Feed, VT – Vertical Tab, FF – Form Feed and CR – Carriage Return) and the sequence ***/**.

4.4 Command Formats

To allow easy command recognition and familiarization, all the commands share a common five character format:

```
XXYYZ
```

where:

- XX = Command group
- YY = Function within group
- Z = Operation code

The following operation codes are used:

- **C** = Change
- **E** = End
- **I** = Initiate
- **P** = Print
- **S** = Set

Note: The term “print” refers to output to the serial port in use for the dialog procedure.

4.5 Command Entry

Each character entered is echoed to the operator's terminal. The BS (backspace) or DEL (delete) character can be used to delete characters entered within the current line. This causes the Signaling Gateway to output the sequence BS space BS. On a visual display terminal, this has the effect of deleting the last character entered from the display.

Commands can be entered whenever the command prompt has been output. Commands are terminated by a semicolon (;) followed by CR. Commands may exceed one line on the terminal, but may not exceed 100 characters.

If a command takes parameters, a colon is used to separate the command from the parameters. A comma (,) is used to separate multiple parameters.

To ensure correct operation of the character deletion, the maximum number of characters entered on a single command line should be no greater than the number of characters that can be displayed on a single line of the terminal (to prevent text "wrap around"). If a command is longer than one line, each line before the last should be terminated with a complete parameter value followed by a comma and CR. The command can then continue on the next line. If you wish to specify more parameters than can be entered on a single initiate command, you should use the initiate command to enter mandatory parameters, then use a change command to specify additional parameters.

A partially entered command can be aborted using the CAN character. The system outputs an indication that the command has been aborted, followed by a prompt for new command input. The CAN character can also be used to abort an output listing on the operators terminal.

4.6 Dangerous Commands

Commands that affect the Signaling Gateway operation are considered DANGEROUS commands. If a DANGEROUS command is entered, the Signaling Gateway outputs the following on a new line:

```
Are you sure? [Y/N]
```

The operator must enter **Y** followed by CR to continue the execution of the command. Any other valid input character apart from SP or CR, followed by CR, causes the command to be aborted.

4.7 Changing Configuration Data

Many configuration commands require that certain other commands have been entered first (for example to block a link before removing a boards configuration). These rules are described on a per-command basis as prerequisites.

4.8 Command Responses

The Signaling Gateway does not, in general, produce output unless it is in response to an operator command. The only exception to this is the auto log off warning message and the log off message (when log off is initiated automatically).

The auto log off warning message is as follows:

```
WARNING: Auto log off imminent!
```

When a syntactically correct command has been issued to the Signaling Gateway, acceptance is indicated by the Command Executed output as follows:

```
EXECUTED
```

An invalid command is not acted upon. The Signaling Gateway indicates command rejection by issuing one of the responses in Table 1. Only the first error detected in a command is indicated.

Table 1. Command Rejection Responses

Response	Reason for Rejection
CONFIGURATION EXCEEDS LICENSE LIMITS	The entity being configured exceeds the limits of the license installed on the system.
EXTRA PARAMETERS	Too many parameters have been entered.
GENERAL ERROR	Command unable to execute due to an external error (for example, a missing or write-protected CDROM).
ILLEGAL COMMAND	The command is invalid for the mode of operation.
INCONSISTENT DATA	The values of parameters are inconsistent with each other or with data already entered into the system.
INCONSISTENT PARAMETER	The parameters input are not valid together for the command.
INTERNAL ERROR	Command failed to complete due to internal error.
INVALID INDICATOR	This command contains a 'format character' (':', ';', etc.) that is not valid for this command.
INVALID INFORMATION GROUPING	The type of information grouping used in the input of the parameter value is not valid.
INVALID INFORMATION UNIT	The value entered for a parameter is not valid for that parameter.
INVALID PARAMETER NAME	A parameter name has been entered that is not valid for this command.
MISSING DATA	A parameter has no data.
MISSING PARAMETER	A required parameter has not been input.
NO SYSTEM RESOURCES	The requested command cannot be executed due to unavailable system resources.
RANGE ERROR	The value assigned to a numeric parameter is outside the valid range.
UNACCEPTABLE COMMAND	The command is valid but not in the current state of the equipment (for example, changing a signaling link configuration without blocking).
UNKNOWN COMMAND	The command is not recognized.
UNKNOWN SEPARATOR	The character used to separate two parameters is not recognized.

4.9 FTP Access

The Signaling Gateway supports FTP server operation allowing you to perform maintenance operations, such as software, license and configuration update without the use of MML as well as providing access to locally stored continuous records and periodic reports.

An FTP session should be established between the remote machine and the Signaling Gateway by entering the appropriate command on the remote machine's keyboard, for example:

```
ftp 123.124.125.125
```

The FTP server can be activated or deactivated using the FTPSER parameter on the CNSYS command.

The appropriate user name and password to use depends on whether the FTPPWD option has been set to Y using the CNSYS MML command.

When FTPPWD = Y, FTP access must use the fixed user name "siuftp" in conjunction with the normal MML access password as configured by setting the CNSYS parameter PASSWORD.

Access to the Signaling Gateway using other user accounts except "siuftp" is denied. Note also that access is denied if FTPPWD = Y, but there is no MML password.

When FTPPWD=N, no FTP access is permitted. Access with "siuftp" or any other user account is disabled. Therefore, you are strongly advised to activate FTP password security.

The state of FTPPWD can be viewed using the CNSYP command.

For additional security, the Signaling Gateway supports the use of Secure Shell (SSH) access for FTP operation. The user should use the CNSYS command to allow only secure FTP access to the unit, for example:

```
CNSYS:SECURE=Y;
```

For a client on a UNIX operating system, the command sequence to log in for FTP access using the sftp application is:

```
sftp -l ftp@<IP Address>
```

The user is also prompted to enter the password for the siuftp login account.

The secure connection to a unit can also be established from Windows® operating system using the appropriate SSH software.

4.10 Backing Up System Software

The user can backup a binary copy of the Signaling Gateway software for restoration later.

4.10.1 Software Backup to a Remote Data Center

The procedure to perform a software backup to an Remote Data Center (RDC) is as follows:

1. The user should enter:

   ```
   CNBUI: RDC=<rdc id>, DTYPE=SOFTWARE,
          DIRECTORY=<subdirectory>,FILE=<filename>;
   ```

   to request that the software be backed up to an RDC where the software file <filename.tgz> is stored in a subdirectory in the ftproot.

   Note: The user should **not** use a filename of “sgw” when backing up to the local RDC.

   The unit indicates that the configuration has been successfully backed up by displaying the “EXECUTED” response to the CNBUI command.

4.11 Updating System Software

The configuration data, stored in non-volatile memory, is not affected by a software update.

Normal operation of the software update procedure uses MML to update the software. While a software update can take place while phone calls are in progress, the new software is not activated until the system is restarted.

On completion of the software update, you must perform a system restart. MML commands are restricted to the following “safe” mode commands: CNSYS, CNUPI, CNBUI and STRDP commands, as well as the alarm log and configuration print commands.

If you abort the software update or the software update process fails, the system alarm “SW mismatch” is activated and you are restricted to “safe” mode commands. If you restart the system in this state, the system restarts in “safe” mode running limited configuration only software.

Note: Prior to performing a system upgrade, it is recommended that you make a backup of the system configuration using the procedures specified in Section 4.12, “Backing Up Configuration Data” on page 33.

4.11.1 Software Update from a Remote Data Center

The procedure to perform a software update from a Remote Data Center (RDC) is as follows:

1. The user should enter:

   ```
   CNUPI:DTYPE=SOFTWARE,RDC=<rdc id>,
         DIRECTORY=<subdirectory>,FILE=<filename>;
   ```

   to request that the software be updated from a RDC where the software update files are stored in a subdirectory in the ftproot.

   Note: The directory and filename are optional and when not used the system looks for the file sgw.tgz in the ftproot directory. If <filename> is specified, it should be specified without an extension.

2. Once you have confirmed that the software should be upgraded, the distribution file is transferred to the Signaling Gateway without further interaction with the user. The unit indicates that the file has been successfully transferred by displaying the “EXECUTED” response to the CNUPI command.
3. On completion, you should restart the system by executing the MNRSI command.

4.11.2 Software Update from Portable Media

The following procedure assumes that a CD-ROM or USB drive with the updated software has already been created. Perform the software update as follows:

1. Insert the CD or USB into the Signaling Server.
2. Enter the following command:

   ```
   CNUPI:DTYPE=SOFTWARE,DIRECTORY=<subdirectory>,FILE=<filename>;
   ```

   to request that the software be updated from the media.

   Note: The directory and filename are optional and when not used the system looks for the file sgw.tgz in the root directory.

3. Prompts are displayed asking first if you are certain that you wish to upgrade the software and then to insert the portable media.

   The software is uploaded from the distribution portable media to the Signaling Gateway. The unit indicates that all files have been successfully transferred by displaying the “EXECUTED” response to the CNUPI command.

   Following installation, the CD will be ejected from the CD-ROM drive to prevent the updates being overwritten in subsequent restarts.
4. The user should restart the system by entering the MML command MNRSI.

4.11.3 Software Update from Startup

You are also able to update the software from system start. Installation of software from system start is not normal operating procedure and should only be used if you are unable to install software via MML. A failed installation of software from system start can result in the system failing to operate. The procedure to install software from system start using either FTP or portable media is as follows:

Software Update from Startup Using FTP

1. Rename the software distribution to sgw.tgz.
2. Establish an FTP session (see Section 4.9, “FTP Access” on page 30).
3. Set the FTP transfer mode to “Binary”, since the software file is a binary file.
4. Transfer the software to the Signaling Gateway by typing the command “put sgw.tgz sgw.tgz”.

   Note: The Signaling Gateway uses a case-sensitive file system. Therefore, it is necessary to specify sgw.tgz in lowercase.

5. Terminate the FTP session by entering “quit” or “bye”.

6. Establish an MML session and restart the unit by typing the MNRSI command.
   The machine then boots and completes the upgrade. Once the upgrade is complete, the machine is accessible via the MML.
7. Check the software version using the CNSWP command.

Software Update from Startup Using a CD or USB Drive

1. Insert the portable media into the Signaling Server.
2. Restart the system.
   The new software is installed and started automatically.

4.12 Backing Up Configuration Data

You can backup a binary copy of the Signaling Gateway configuration for restoration later.

4.12.1 Configuration Backup to Remote Data Center

The procedure to perform a configuration backup to an RDC is as follows:

1. You should enter:

```
CNBUI:RDC=<rdc id>, DTYPE=CONFIG,
      DIRECTORY=<subdirectory>,FILE=<filename>;
```

   to request that the configuration be backed up to an RDC where the configuration file <filename.CF3> is stored in a subdirectory in the ftproot.

   Note: You should **not** use a filename of “SDC” when backing up to the local RDC.

   The unit indicates that the configuration has been successfully backed up by displaying the “EXECUTED” response to the CNBUI command.

4.13 Updating Configuration Data

Valid configuration data can be stored by the Signaling Gateway at a Remote Data Center (RDC) using the CNBUI command (see Section 4.12), on portable media (USB or CD) or on a remote machine accessible via FTP. This configuration data can then be restored as described in the following subsections.

4.13.1 Configuration Update from a Remote Data Center

The procedure to perform a configuration update from a Remote Data Center (RDC) is as follows:

1. You should enter:

```
CNUPI:DTYPE=CONFIG,RDC=<rdc id>,
      DIRECTORY=<subdirectory>,FILE=<filename>;
```

   to request that the configuration be updated from a RDC where the configuration update file <filename.CF3> is stored in a subdirectory in the ftproot.

   Note: The directory and filename are optional and when not used the system looks for the SDC.CF3 file in the ftproot directory.

   The unit indicates that the configuration has been successfully transferred by displaying the “EXECUTED” response to the CNUPI command.
2. You should then restart the system by entering the MML command MNRSI.

4.13.2 Configuration Update from Portable Media

The procedure for a configuration update from a CD or USB device using MML is as follows:

1. You should enter:

   ```
   CNUPI:DTYPE=CONFIG, DIRECTORY=<subdirectory>,FILE=<filename>;
   ```

   to request that the configuration file be updated from CD or USB.

   Note: The directory and filename are optional and when not used the system looks for the SDC.CF3 file in the CD or USB root directory.

   The configuration file is uploaded from CD or USB. The unit indicates that the configuration has been successfully updated by displaying the “EXECUTED” response to the CNUPI command.

   Following updates, the CD will be ejected from the CD-ROM drive to prevent updates being overwritten on subsequent restarts.

2. You should then restart the system by entering the MML command MNRSI.

4.13.3 Configuration Update from Startup

You is also able to install a previously backed-up system configuration from system start.

Note: Installation of configuration from system start is not normal operating procedure and should only be used if you are unable to install configuration via MML. A failed installation of configuration from system start can result in the complete loss of system configuration.

The procedures to install configuration from system start using either FTP or CD are described below.

Configuration Update from Startup using FTP

1. Rename the binary configuration file to SDC.CF3.
2. Establish an FTP session (see Section 4.9, “FTP Access” on page 30).
3. Set the FTP transfer mode to “Binary”, since the configuration file is a binary file.
4. Transfer the configuration to the Signaling Gateway by entering the command “put SDC.CF3 SDC.CF3”.

   Note: The Signaling Gateway uses a case-sensitive file system. Therefore, it is necessary to specify SDC.CF3 in uppercase.

5. Terminate the FTP session by entering “quit” or “bye”.
6. Establish an MML session and restart the unit by typing the MNRSI command.

   The machine then boots and completes the upgrade. Once the upgrade is complete, the machine is accessible via the MML.

Configuration Update from Startup using CD or USB

1. Insert the CD or USB containing the configuration file SDC.CF3 into the Signaling Server.
2. Restart the system.

   The new configuration is installed and started automatically.

4.14 Creating a System Archive

A system archive comprising the binary configuration file, installed software licenses and current software binary distribution file can be created on the Signaling Server portable media (CDROM or USB device) and later used to restore the system to current working status.

As the Signaling Server starts up a copy is created of the following system files which are stored in the syslog subdirectory of the siuftp account.

Table 2. System Files Stored in the syslog Subdirectory

File	Description
sgw.tgz	A binary file containing the current software distribution on the system.
sgw.lic	A text file containing the current software licenses active on the system, if present.
modcap	A binary file containing a software license allowing SS7G2x operating software to function on this particular system.
config.CF1	A binary configuration file containing dynamically configurable data that is common to all modes of operation. IP address configuration and parameters set by the CNSYS command would for example be stored in this file.
config.txt	The text configuration file for a SIU, if present.
SDC.CF3	The binary configuration file for a SGW, if present.
SDC.CF4	The binary configuration file for a DSC, if present.

The files can be recovered from the syslog directory using FTP as described below:

```
ftp 192.168.0.1user siuftppassword ********cd syslog
asciiget config.txtget sgw.licbinget sgw.tgzget sgw.licget modcapget config.CF1get SDC.CF3get
SDC.CF4bye
```

To create the archive all the files can be transferring to an ISO9660 format CD or USB device. To check that the archive media device has been created without error - return the device to the unit and enter the following command:

```
CNUPI:DTYPE=SYSKEY;
```

If this command returns ‘EXECUTED’, then the media contains a valid software license.

4.15 Restoring System Archive

The Signaling Server is restored to the archived software, configuration and licensing states when the archive portable media device is placed in the appropriate drive and the system is re-booted.

On re-boot, the system will restore all files from the portable media device to the system. Configuration files from the portable media will overwrite any in the SIUFTP directory.

Note: Once the system has been restored you must ensure that the portable media device is removed from the unit, otherwise on subsequent re-boot the system will reinstall the archive files.

If the user changes dynamically configurable data on the system using MMI (i.e., MMI commands are described in this manual with the attribute ‘CONFIG’), a new configuration backup can be added to the syslog directory in the siuftp account. To do this without restarting the system, enter the following command:

```
CNBUI:DTYPE=SYSCFG;CNBUI:DTYPE=CONFIG;
```

Following this command, a new CD archive should be created following the procedures identified in Section 4.14, “Creating a System Archive” on page 35.

Note: The user can also re-install any of the previously backed-up system files (identified in Section 4.14, “Creating a System Archive” on page 35), or install a new text configuration file using FTP rather than from portable media. In this case, files can transferred to the unit by FTP.

Chapter 5: Parameter Definitions

5.1 Parameter Table

Table 3 lists parameters and details the possible values.

All numeric parameters are entered and output in decimal notation.

<text character> is either <lower case letter>, <upper case letter>, <digit>, $, or -. The use of quotation marks to delimit text strings is not required.

Table 3. Parameter Definitions

Name	Description	Range	Notes
ALP	Sequential reference number of an entry in the Alarm Log	1 to 9999	
AUTH	V3 SNMP Authentication encryption protocol - used to ensure that V3 SNMP requests have not be modified during transit.	Set to SHA or MD5	
AUTHPASS	SNMP V3 User account Authentication password.	8 to 12	Must be set if the AUTH parameter is set.
BCIC	The circuit identification code of an SS7 circuit that is the base CIC of a CIC Range	0 to 4095	
BPOS	Board position number (for signaling boards)	1 to 3	
BRDTYPE	Dialogic® DSI Network Interface Board type descriptor, in the format: xxxxxx-y-z where: • xxxxxx = board type • y = number of signaling links configured on the board • z = number of PCM ports on the board See Section 5.4, "Dialogic® DSI Network Interface Board Types" on page 48.	One of the following: • SPCI2S-4-2 • SPCI2S-8-2 • SPCI4-4-4 • SPCI4-8-4 • SS7HDP-64-4	
BUILDOUT	The buildout type: • 0 - Setting for E1 devices. • 1 - T1 short haul 0 - 110 ft. • 2 - T1 short haul 0 - 110 ft. • 3 - T1 short haul 110 - 220 ft. • 4 - T1 short haul 220 - 330 ft. • 5 - T1 short haul 330 - 440 ft. • 6 - T1 short haul 440 - 550 ft. • 7 - T1 short haul 550 - 660 ft. • 8 - T1 long haul LB0 (-0dB) • 9 - T1 long haul LB0 (-7.5dB) • 10 - T1 long haul LB0 (-15dB) • 11 - T1 long haul LB0 (0dB TR62411)	0 to 11	Default = • 0 for E1 • 1 for T1
C7LINK	Logical reference for an SS7 signaling link	1 to 256	
C7RT	Logical reference of an SS7 route	1 to 4096	
CLA	Alarm class number. One of: • 0 = Unreported (the alarm is logged, but it does not trigger an alarm relay and is not included in SNMP output. • 5 = Minor (triggering the MNR alarm LED and relay) • 4 = Major (triggering the MJR alarm LED and relay) • 3 = Critical (triggering the CRT alarm LED and relay)	0, 3, 4, 5	

Table 3. Parameter Definitions (Continued)

Name	Description	Range	Notes
CODE	Fault code of a system alarm	1 to 256	
CONFIRM	Confirmation of a password used to provide password control access to MML	0 to 12 <text character>	
CONTACT	Label identifying person/group responsible for the Signaling Server.	Maximum 24 characters	e.g admin@email.com
CRTYPE	The type of continuous record: • ALARM – alarms that have been reported to the alarm log	ALARM	
DATE	Calendar date, in the format: xxxx-yy-zz where: • xxxx – 4 digit year • yy – 2 digit month • zz – 2 digit day	xxxx – 1990 to 2037 yy – 01 to 12 zz – 01 to 31	
DBITS	Number of data bits on V.24 port	7 or 8	Default = 8
DEST	Signaling Gateway Destination Point ID	1 to 512	
DIRECTORY	Directory name on a remote data center.	0 to 12 <text character>	
DISCARD	Whether data can be discarded	Y or N	Default = N
DOMAIN	Domain	One of: • IP • MTP	
DOWN	SNMP object transition state.	One of: • All • Create • Change • Destroy • None	Traps will be generated if set to All, Create, Change or Destroy. Traps will not be generated if set to NONE. Default = Change
DPC	SS7 destination point code	0 to 16777215	
DTYPE	The type of saving/loading operation to be performed from a remote data center. See Section 5.2, “Remote Operations” on page 46.	One of: • SOFTWARE • CONFIG • LICENSE	
DUPLEX	Specifies whether a connection is duplex (Y) or simplex (N).	Y or N	Default = N
END	Specifies whether the Signaling Gateway’s end of the SIGTRAN link is acting as either a client (C) or a server (S).	C or S	
ENGINE	V3 SNMP Identifies the Engine part of the remote SNMP entity (manager).	Max 24 hexadecimal digits	
EQU	Signaling processor hardware identifier in the format: x-y where: • x = board position (BPOS) • y = signaling link within the board.	x – 1 to 3 y – 1 to 64	V.11 links can only use processors 1 and 2. HSL links can only use x-1 or x-33
ETH	• Ethernet port number	1 to 6	

Table 3. Parameter Definitions (Continued)

Name	Description	Range	Notes
FF	PCM frame format: • G704 – Normal E1 format described in G.704 • CRC4 – Normal E1 format with CRC4 checksum generation • CRC4C – Normal E1 format with CRC4 checksum generation. Compatible with non-CRC4 operation. • SF – 12 frame multiframe (D3/D4) • ESF – 24-frame multiframe • CRC6 – ESF format with CRC6 checksum generation • CRC4G706 – CRC4 G.706 compatible mode • UNS - Unstructured High Speed Link **NOTE:** Out of CRC4-multiframe, E-Bits are transmitted as zeroes.	One of: • G704 • CRC4 • CRC4C • SF • ESF • CRC6 • CRC4G706	Default = • G704 for E1 • SF for T1 UNS - can only be specified on SS7HDP signaling boards.
FILE	File name on a Remote Data Center (RDC)	0 to 12 <text character>	
FTPPWD	FTP Password enabled parameter. Set to Y to enable ftp password protection, or N to disable password protection.	Y or N	Default = Y
FTPSER	Indicates whether the Signaling Gateway can act as a ftp server or not. Set to Y to enable the ftp server, or N to disable the ftp server.	Y or N	Default = Y
GATEWAY	An IP gateway used to reach other networks when the destination is not on the local sub-net. Specified using dot notation, that is, www.xxx.yyy.zzz	www – 0 to 255 xxx – 0 to 255 yyy – 0 to 255 zzz – 0 to 255	Default = 0.0.0.0
HPORT	Host SCTP port	1 to 65535	Default = • 2905 for M3UA SNLINKs. • 3565 for M2PA SNLINKs.
HSL	High Speed Link mode	N – The SS7 link is not an HSL Link. Y – The SS7 link is an HSL link with 12 bit sequence numbers. SQ7 - SS7 link is an HSL link with 7 bit sequence numbers.	
IMPAIR	SNMP object transition state.	One of: • All • Create • Change • Destroy • None	Traps will be generated if set to All, Create, Change or Destroy. Traps will not be generated if set to NONE. Default = Change
INACTIVE	SNMP object transition state.	One of: • All • Create • Change • Destroy • None	Traps will be generated if set to All, Create, Change or Destroy. Traps will not be generated if set to NONE. Default = Change
INHIBIT	Invoke/revoke MTP3 management inhibiting of an SS7 signaling link	Y or N	Default = N

Table 3. Parameter Definitions (Continued)

Name	Description	Range	Notes
IPADDR	Internet Protocol (IP) address of the Signaling Gateway Ethernet port 1 specified using dot notation, that is, www.xxx.yyy.zzz	www – 0 to 255 xxx – 0 to 255 yyy – 0 to 255 zzz – 0 to 255	Default = 0.0.0.0
IPGW	Logical reference for an Internet Protocol Gateway	DEFAULT or value 1 to 31	
IPNW	IP network identifier specified using dot notation, that is, www.xxx.yyy.zzz	www – 0 to 255 xxx – 0 to 255 yyy – 0 to 255 zzz – 0 to 255	Default = 0.0.0.0
IR	Logical reference for a incoming route	1 to 32	
ITS	The input timeslot in a cross connection (in the case of a duplex cross connection, this is also the output timeslot for the reverse direction). The format is: xx-y-zz where: • xx = board position (BPOS) • y = PCM within a board • zz = timeslot	xx – 1 to 3 y – 1 to 4 zz – 1 to 31	
LABEL	Text label.	0 to 12 <text character>	
LC	PCM line coding	One of: • HDB3 • AMI • B8ZS	Default = • HDB3 for E1 • B8ZS for T1
LINES	Number of MML lines per page	10 to 99	Default = 25
LOCATION	Label identifying the location of the unit. Max 24 characters.		
LSH	Load share across link sets	Y to N	Default = N
LS	Logical reference of an SS7 link set, which can contain a number of signaling links	1 to 64	
LS1	Primary link set associated with an SS7 route	1 to 64	
LS2	Secondary linkset associated with an SS7 route	1 to 64	
LSSIZE	Maximum number of SS7 links allowed in the link set. The link set size is used to determine the load sharing algorithm used across the link set.	1 to 16	
M3UASHARE	The percentage of licensed throughput to be allocated to the M3UA protocol. Throughput capacity not allocated to M3UA will be allocated to M2PA.	Blank (no value) or 1 to 99	After a change to the M3UASHARE parameter, the system should be restarted so that the change takes effect.
M56K	56kbits signaling mode: • 0 - 64 kbits/s used • 1 - 56kbits/s enabled (bit 8 not used) • 2 - 48kbits/s enabled (bits 7 and 8 not used) • 3 - Recover clock from V.11 interface • 4 - Transmit clock to V.11 interface	0 to 4	Default = 0 M56K modes 3 and 4 can only be set on boards with SIGTYPE = SS7 For framed HSL, the valid M56K modes are 0(64k), 1(56k) and 2(48k). These values are used to identify the data rate, which is applied to all timeslots on the link. For unstructured HSL links, the M56K parameter must be set to 0.

Table 3. Parameter Definitions (Continued)

Name	Description	Range	Notes
MASK	IP network mask specified using dot notation, that is, www.xxx.yyy.zzz	www – 0 to 255 xxx – 0 to 255 yyy – 0 to 255 zzz – 0 to 255	
MINREC	The minimum number of records held by the Signaling Gateway before transfer	100 to 200	
MNGR	Logical identifier for an SNMP manager.	1 to 32	
NA	Network appearance	0 to 2147483647	
NASP	Number of ASP required in load sharing mode	0 to 32	Default = 0
NC	Signaling Gateway SS7 network context	1 to 4	
NI	Network Indicator for an SS7 link set	0 to 3	
OBJECT	Identifier of a table within a Signaling Server Group Object.		Refer to *Dialogic® DSI Signaling Servers SNMP User Manual* (U05EPP01) for MIB details.
OBJGRP	Identifier of the Signaling Server Group Object in the DSMI MIB.	• 1 - Management Group • 2 - System Group • 3- Platform Group • 4 - IP Group • 5- Board Group • 6 - SS7 Group • 7 SIGTRAN Group • 8 - Access Group.	Refer to *Dialogic® DSI Signaling Servers SNMP User Manual* (U05EPP01) for MIB details.
OPC	SS7 Originating Point Code	0 to 16777215	
OTS	The output timeslot in a cross connection (in the case of a duplex cross connection, this is also the input timeslot for the reverse direction). The format is: xx-y-zz where: • xx = board position (BPOS) • y = PCM within a board • zz = Timeslot	xx – 1 to 3 y – 1 to 4 zz – 1 to 31	
PAGE	The page of data to be printed	1 to 10	Default = 1
PARITY	Parity option on V.24 port. Affects transmit parity only, parity is ignored on receive.	One of: • ODD • EVEN • NONE	Default = NONE
PASSWORD	Used to specify the password for either remote login access or to provide password control for Signaling Gateway MML	0 to 12 <text character>	
PCM	PCM interface on a board in the format: xx-y where: • xx = board position (BPOS) • y = PCM within a board	xx – 1 to 3 y – 1 to 4	
PCMD	Application Server Point Code mode: • ANY – If any Application Server is in service then the Point Code the Application Server exists within is considered to be up. • ALL – Only when all the Application Servers within a Point Code are in service will the Point Code they exist within be considered to be up.	One of: • ANY • ALL	

Table 3. Parameter Definitions (Continued)

Name	Description	Range	Notes
PCMTYPE	The type of PCM in use	One of: • T1 • E1	
PCR	Preventive Cyclic Retransmission	Y or N	Default = N
PER	Personality configuration	0 to 255	Default = 0
PERIOD	A period of time in the format: xx:yy:zz where: • xx = 2 digit hour • yy = 2 digit minute • zz = 2 digit second	xx – 00 to 23 yy – 00 to 59 (yy must be 00, when xx is 23) zz – 00 to 59 (zz must be 00, when xx is 23)	
PORT	V24 port identifier **NOTE:** Port 1 is not physically accessible.	1 to 4	
	SNMP destination port for SNMP traps.		Default =162
PPORT	The SCTP port associated with the peer on a SIGTRAN link	1 to 65535	Default = • 2905 for M3UA SNLINKs • 3565 for M2PA SNLINKs
PRIV	SNMP V3 Privacy encryption protocol.	One of: • DES • AES	
PRIVPASS	SNMP V3 User account Privacy password. Must be set if the PRIV parameter is used.	8 to 12	Must be set if the PRIV parameter is used.
PRTYPE	The type of periodic report: • MSC7 – periodic reporting of traffic measurements for CCS SS7 links. • MSPCM – periodic reporting of traffic measurements for PCMs. • MSSL – periodic reporting of traffic measurements for SIGTRAN links. • MSEP – periodic reporting of Ethernet port measurements. • MSSY – periodic reporting of System measurements.	One of: • MSC7 • MSSL • MSPCM • MSEP • MSSY	
PTMODE	Mode for serial port	One of: • NONE • DTRDSR • TELNET	Default = • DTRDSR for ports 1 and 2 • TELNET for ports 3 and 4
QUIESCE	SNMP object transition state.	One of: • All • Create • Change • Destroy • None	Traps will be generated if set to All, Create, Change or Destroy. Traps will not be generated if set to NONE. Default = Change
RANGE	CIC range	0 to 4095	
RAS	Logical reference for a SIGTRAN Remote Application Server	1 to 200	
RC	The routing context of a SIGTRAN link within an Application Server	0 to 2147483647	
RCOM	Read only Community String. The Signaling Server SNMP agent will silently discard received PDUs that have a community string not identical to this value.	A maximum 12 alphanumerical characters.	Default value = 'public'
RDC	Remote Data Center (RDC) identifier	1 to 4	

Table 3. Parameter Definitions (Continued)

Name	Description	Range	Notes
RDC1	First choice RDC for a continuous record or periodic report	1 to 4	
RDC2	Second choice RDC for a continuous record or periodic report. Zero indicates no RDC is assigned.	0 to 4	Default = 0
RECORD	The identifier for a continuous data collection record	1 to 6	
REPORT	The identifier for a periodic data collection report	1 to 5	
RESET	Performs a reset operation	Y or N	Default = N
RESTART	Specifies the type of restart operation, which can be one of the following: • NORMAL - The system undergoes a full system restart, resetting the hardware, operating system and signaling software. This is the default behavior. NORMAL resets should be used for software upgrade or for maintenance events. • SOFT - The system restarts the application software. Prior to a soft restart, the signaling boards are reset. SOFT resets may be used for a more rapid system restart after updating the system configuration or licenses. However, if a new software distribution is to be installed, the system performs a NORMAL restart. • HALT - The system shuts down without a subsequent restart. **Caution: Once the system has been halted, the only way to restart the unit is by physically pressing the Power switch on the front panel of the chassis.**	One of: • NORMAL • SOFT • HALT	
	SNMP object transition state.	One of: • All • Create • Change • Destroy • None	Traps will be generated if set to All, Create, Change or Destroy. Traps will not be generated if set to NONE. Default = Change
RKI	Routing Key Index An identifier for either a complete routing key or part of a routing key.	1 to 512	
RKTAB	Routing Key Table A table of particular routing keys.	1 to 8	
RTPRI	Destination route priority	One of: • NONE • MTP	Default = NONE
RTS	A timeslot within a PCM interface on a board used for monitoring information received by the monitored object. The format is: xx-y-zz where: • xx = board position (BPOS) • y = PCM within a board • zz = timeslot	xx – 1 to 3 y – 1 to 4 zz – 1 to 31	
SBITS	Number of stop bits on V.24 port	1 to 2	Default = 1
SECURE	Secure operation. When active offers a higher level of security. The use of the parameter is command specific. See the CNSYS and SNSLI command descriptions for more information.	Y or N	Default = N

Table 3. Parameter Definitions (Continued)

Name	Description	Range	Notes
SEQ	Sequence number	1 to 32	
SG	Reserved		
SI	Reserved		
SIGTYPE	Type of software loaded onto signaling board	SS7	
SLC	Signaling link code uniquely identifying a signaling link within a link set	0 to 15	
SNMP	Whether SNMP should be active on the system		
	SNMP version running of the system	Set to DK4032, DSMI or NONE	
SNRT	Reserved		
SNTYPE	The type of operation of the SIGTRAN link	One of: • SGM3UA • M2PA	
SNLINK	Logical reference for a SIGTRAN link	1 to 256	
SPEED	The speed of an Ethernet port. The values 10, 100, 100 select 10 MHz, 100 MHz and 1 GHz respectively. An “H” appended to the value indicates half-duplex operation; values without the appended “H” are full-duplex operation.	One of: • AUTO • 10 • 100 • 1000 • 10H • 100H	Default = AUTO
SRTX	Number of times a packet of SIGTRAN information can be retransmitted before determining that the SIGTRAN link has gone out of service	2 to 10	
SS7MD	SS7 signaling mode: • ITU14 – ITU operation with 14 bit Point Code • ITU16 – ITU operation with 16 bit Point Code • ITU24 – ITU operation with 24 bit Point Code • ANSI – ANSI operation with 24 bit Point Code	One of: • ITU14 • ITU16 • ITU24 • ANSI	
STS	A timeslot within a PCM interface on a board used for monitoring information sent by the monitored object. The format is: xx-y-zz where: • xx = board position (BPOS) • y = PCM within a board • zz = timeslot	xx – 1 to 3 y – 1 to 4 zz – 1 to 31	
SUBNET	Subnet mask for the network to which the Signaling Gateway is connected specified using dot notation, that is, www.xxx.yyy.zzz	www – 0 to 255 xxx – 0 to 255 yyy – 0 to 255 zzz – 0 to 255	Default = 255.255.255.0
SYNCPRI	The priority the PCM is given to provide clock synchronization: • 0 – Indicates never provide clock synchronization • 1 – Highest priority that PCM should provide clock synchronization • 32 – Lowest priority, that is, other PCMs have precedence	0 to 32	Default = 0
SYSID	System identity	0 to 12 <text character>	
SYSREF	The system reference number	0 to 999	Default = 0

Table 3. Parameter Definitions (Continued)

Name	Description	Range	Notes
SYSTYPE	The type of system to be run	One of: • SGW • DSC • SIU	
TCOM	SNMP Trap Community String	Max 12 alphanumerical characters	
TFORMAT	Format of SNMP trap to be dispatched to the SNMP manager	• 1 - SNMP V1 • 2 - SNMP V2 • 3 - SNMP V2 INFORM	
TIME	Time of day in the format: xx:yy:zz where: • xx – 2 digit hour • yy – 2 digit minute • zz – 2 digit second	xx – 00 to 23 yy – 00 to 59 zz – 00 to 59	
TLO	Auto log off time (in minutes)	1 to 60	Default = 30
TLOW	Log off warning time (in minutes)	0 to 60	Default = 25
TMSEC	Timer values in milliseconds associated with a timer number (resolution is 100ms)	100 to 10000 (in integer multiples of 100)	
TO	Signaling system dependent timer number. As specified in the particular signaling system's list of timers.	1 to 999	
TS	A timeslot within a PCM interface on a board in the format: xx-y-zz where: • xx = board position (BPOS) • y = PCM within a board • zz= Timeslot	xx – 1 to 3 y – 1 to 4 zz – 1 to 31	
TSEC	Timer values in seconds associated with a timer number	1 to 3000	
TTYPE	Timer Type See Section 5.3, "Signaling Gateway Timers" on page 46 for definitions of Signaling Gateway "CONV" specific timers.	One of: • MTP3 • MTP3A • SCTP • CONV	
UP	SNMP object transition state.	One of: • All • Create • Change • Destroy • None	Traps will be generated if set to All, Create, Change or Destroy. Traps will not be generated if set to NONE. Default = Change

Table 3. Parameter Definitions (Continued)

Name	Description	Range	Notes
USER	User name	0 to 12 <text character>	
	SNMP V3 Logical identifier for an SNMP user account.	1 to 32	
WARNING	SNMP object transition state.	One of: • All • Create • Change • Destroy • None	Traps will be generated if set to All, Create, Change or Destroy. Traps will not be generated if set to NONE. Default = Change
WCOM	Read/Write Community String. The Signaling Server SNMP agent will silently discard received PDUs that have a community string not identical to this value.	A maximum 12 alphanumerical characters.	Default value = 'private'.

5.2 Remote Operations

Table 4 gives the possible remote operation types.

Table 4. Remote Operation Types

DTYPE	Description
SOFTWARE	Selecting this operation allows the user to upload a new software version.
CONFIG	Selecting this operation allows the user to upload a previously backed up version of the configuration.
LICENSE	Selecting this operation allows the user to upload new software licenses.

5.3 Signaling Gateway Timers

5.3.1 Signaling Gateway-Specific Timers

Table 5 shows the Signaling Gateway specific timers. Timers for specific protocols are given in subsequent tables in this section.

Table 5. Signaling Gateway Specific Timers

T0	Range (seconds)	Default (seconds)	Description
5	5 to 20	7	Wait for board response guard timer. This timer starts when internal messages are sent to a signaling board and stopped when an acknowledgement is received. On timer expiry, it reports an error. If the internal message sent to a board related to setting up a speech path for a call, then the call is released using internal token 135.
7	2 to 10	3	MML wait for maintenance confirmation timer. The timer is started when a MML maintenance request is performed. It is stopped when a confirmation from the remote site to the maintenance request is received. On timer expiry, a confirmation to the request is internally generated allowing further MML commands to be entered.

5.3.2 MTP3-Specific Timers

MTP3 ITU timers are given in Table 6.

Table 6. MTP3 ITU Timers

TO	Range (milliseconds)	Default (milliseconds)	Description
1	500 to 1200	1000	Delay to avoid message mis-sequencing on changeover
2	700 to 2000	1500	Waiting for changeover acknowledgement
3	500 to 1200	1000	Time controlled diversion-delay to avoid mis-sequencing on changeback
4	500 to 1200	1000	Waiting for changeback acknowledgement (first attempt)
5	500 to 1200	1000	Waiting for changeback acknowledgement (second attempt)
6	500 to 1200	1000	Delay to avoid message mis-sequencing on controlled rerouting
10	30 to 60 sec.	45 sec.	Waiting to repeat signaling route set test message
12	800 to 1500	1200	Waiting for uninhibit acknowledgement
13	800 to 1500	1200	Waiting for force uninhibit
14	2000 to 3000	3000	Waiting to start signaling route set congestion test
17	800 to 1500	1000	Delay to avoid oscillation of initial alignment failure and link restart
22	180 to 360 sec.	270 sec.	Local inhibit test timer
23	180 to 360 sec.	270 sec.	Remote inhibit test timer
24	N/A	N/A	Reserved

MTP3 ANSI timers are given in Table 7.

Table 7. MTP3 ANSI Timers

TO	Range (milli-seconds)	Default (milliseconds)	Description
1	500 to 1200	1000	Delay to avoid message mis-sequencing on changeover
2	700 to 2000	1500	Waiting for changeover acknowledgement
3	500 to 1200	1000	Time controlled diversion-delay to avoid mis-sequencing on changeback
4	500 to 1200	1000	Waiting for changeback acknowledgement (first attempt)
5	500 to 1200	1000	Waiting for changeback acknowledgement (second attempt)
6	500 to 1200	1000	Delay to avoid message mis-sequencing on controlled rerouting
10	30 to 60secs	45 sec.	Waiting to repeat signaling route set test message
12	800 to 1500	1200	Waiting for uninhibit acknowledgement
13	800 to 1500	1200	Waiting for force uninhibit
14	2000 to 3000	3000	Waiting to start signaling route set congestion test
17	800 to 1500	1000	Delay to avoid oscillation of initial alignment failure and link restart
21	N/A	N/A	Reserved
22	180 to 360 sec.	270 sec.	Local inhibit test timer **NOTE:** This timer is referred to as timer T20 in the ANSI specification.
23	180 to 360 sec.	270 sec.	Remote inhibit test timer **NOTE:** This timer is referred to as timer T21 in the ANSI specification.
24	N/A	N/A	Reserved

5.3.3 SCTP-Specific Timers

SCTP-specific timers are given in Table 8.

Table 8. SCTP-Specific Timers

TO	Range (milliseconds)	Default (milliseconds)	Description
1	100 to 500	500	Minimum retransmission timeout (RTO)
2	100 to 60000	2000	Maximum retransmission timeout (RTO)
3	T1 to T2	1000	Retransmission timeout RTO initial value
4	100 to 3000	1000	SCTP Heartbeat timer

5.4 Dialogic® DSI Network Interface Board Types

Table 9 shows the Dialogic® DSI Network Interface Board types.

Table 9. Dialogic® DSI Network Interface Board Types

BRDTYPE	Description
SPCI2S-4-2	Signaling Server network interface board with 4 signaling links configured and 2 PCMs. Used when configuring signaling boards with a SIGTYPE of SS7.
SPCI4-4-4	Signaling Server network interface board with 4 signaling links configured and 4 PCMs. Used when configuring signaling boards with a SIGTYPE of SS7.
SS7HDP-64-4	Signaling Server network interface board with 64 signaling links configured and 4 PCMs. Used when configuring signaling boards with a SIGTYPE SS7.

Chapter 6: Command Definitions

6.1 Command Groups

The commands are broken down into a number of command groups as follows:

- Alarm Commands
- Configuration Commands
- SS7 Signaling Commands
- IP Commands
- MML Commands
- Maintenance Commands
- Measurement Commands
- Remote Data Center Commands
- Signaling Gateway Commands
- SIGTRAN Commands
- Status Commands

6.2 Command Notation

The following conventions are used in the command definitions:

- Items in square brackets [ ] are optional.
- Items separated by a vertical bar | are alternatives, only one of which can be used.
- Curly brackets { } are used to designate a group of optional items of which at least one must be selected.
- The sequence of three dots … is used to indicate that a number of values can be entered, linked by the **&** or **&&** operator.

6.3 Command Attributes

The following symbols are used to indicate command attributes:

- **CONFIG -** The command affects configuration data.
- **PROMPT -** A “DANGEROUS” command, which must be confirmed by the operator.

6.4 Alarm Commands

The alarm commands include:

- ALCLS - Alarm Class Set
- ALCLP - Alarm Class Print
- ALFCP - Alarm Fault Code Print
- ALLIP - Alarm List Print
- ALLOP - Alarm Log Print
- ALREI - Alarm Reset Initiate
- ALTEI - Alarm Test Initiate
- ALTEE - Alarm Test End

6.4.1 ALCLS – Alarm Class Set

Synopsis

This command assigns an alarm class value to a specified fault code(s).

The alarm class (CLA) is used to determine whether the alarm is classed as Minor, Major or Critical and in turn governs the alarm LED, relay and SNMP alarm that are activated when the condition exists.

Each alarm code (CODE) has a factory-set default class. See Chapter 8, “Alarm Fault Code Listing” for the factory default for each alarm code.

Syntax

```
ALCLS:CLA=,CODE=…;
```

Prerequisites

None

Attributes

CONFIG

Examples

```
ALCLS:CLA=3,CODE=20;
```

6.4.2 ALCLP – Alarm Class Print

Synopsis

This command gives a printout of the fault codes belonging to a particular alarm class. If the CLA parameter is omitted, all fault codes are printed out.

Syntax

```
ALCLP[:CLA=];
```

Prerequisites

None

Attributes

None

Examples

```
ALCLP:CLA=3;
ALCLP:CLA=4;
ALCLP:CLA=5;
ALCLP;
```

Output Format

```
Alarm Fault Codes
CODE  CLA  TITLE
11 4Processor1 fail
EXECUTED
```

6.4.3 ALFCP – Alarm Fault Code Print

Synopsis

This command gives a printout of the alarm class of the specified fault code(s).

The alarm class (CLA) is used to determine whether the alarm is classed as Minor, Major or Critical and in turn governs the alarm LED, relay and SNMP alarm that are activated when the condition exists.

Each alarm code (CODE) has a factory-set default class. See Chapter 8, “Alarm Fault Code Listing” for the factory default for each alarm code.

Syntax

```
ALFCP[:CODE=…];
```

Prerequisites

None

Attributes

None

Examples

```
ALFCP;
ALFCP:CODE=8;
```

Output Format

```
Alarm Fault Codes
CODE        CLA       TITLE
8           4         In-band AIS
EXECUTED
```

6.4.4 ALLIP – Alarm List Print

Synopsis

This command gives a printout of all ACTIVE fault codes stored in the system’s alarm log.

Each fault code (CODE) is associated with an alarm class (CLA) which may be Minor, Major or Critical. The alarm class in turn governs which alarm LED, relay or SNMP alarm is activated when the condition exists.

The command provides an indication of the time that the alarm occurred (OCCURRED), the alarm class (CLA indicating either a System, PCM or signaling failure) as well as an alarm code specific identifier (ID) and diagnostic field (DIAG).

See Chapter 8, “Alarm Fault Code Listing” for the definitions of the alarm code specific parameters.

> ***Note:*** The meaning of the ID field depends on the alarm code and is described in Chapter 8, “Alarm Fault Code Listing”.

Syntax

```
ALLIP;
```

Prerequisites

None

Attributes

None

Examples

```
ALLIP;
```

Output Format

```
SYSTEMIDENT1 Alarm List (active alarms) 1996-12-01 00:00:54
ALP  CODE ID  DIAG CLA OCCURRED            CLEARED             TITLE
107     1 103    0 5 A 2001-10-30 10:54:48                     PCM loss
 74     1 104    0 4 A 2001-10-30 10:54:27                     PCM loss
EXECUTED
```

6.4.5 ALLOP – Alarm Log Print

Synopsis

This command gives a printout of the alarm log. If no code or class is entered, the whole log is output.

Each fault code (CODE) is associated with an alarm class (CLA) which may be Minor, Major or Critical. The alarm class in turn governs which alarm LED, relay or SNMP alarm that is activated when the condition exists.

The command provides and indication of the time the alarm occurred (OCCURRED) and, if it has done so, the time the alarm cleared (CLEARED). The output from the command indicates, the alarm class (CLA indicating either a System, PCM or signaling failure) as well as an alarm code specific identifier (ID) and a diagnostic field (DIAG). The C or A character in the CLA field indicates the current status as either A (active) or C (cleared).

See Chapter 8, “Alarm Fault Code Listing” for definitions of the alarm code specific parameters.

Syntax

```
ALLOP[:CODE=…];
ALLOP[:CLA=…];
```

Prerequisites

None

Attributes

None

Examples

```
ALLOP:CODE=20;
ALLOP:CLA=1&&2;
ALLOP;
```

Output Format

```
SYSTEMIDENT1 Alarm Log 1996-12-01 00:00:54
ALP  CODE ID  DIAG CLA OCCURRED            CLEARED             TITLE
107     1 103    0 5 A 2001-10-30 10:54:48 2001-10-30 10:54:53 PCM loss
 74     1 104    0 4 A 2001-10-30 10:54:27 2001-10-30 10:59:53 PCM loss
EXECUTED
```

Note: The C or A character in the CLA field indicates the current status as A (active) or C (cleared). The meaning of the ID field depends on the alarm code and is described in Chapter 8, "Alarm Fault Code Listing".

6.4.6 ALREI – Alarm Reset Initiate

Synopsis

This command removes alarms that have cleared from the alarm log.

Attempts to remove commands that do not have the status CLEARED are rejected.

If parameter ALP is omitted, all alarms with status CLEARED are removed.

Syntax

```
ALREI[:ALP=];
```

Prerequisites

None

Attributes

None

Examples

```
ALREI:ALP=100;
ALREI;
```

6.4.7 ALTEI – Alarm Test Initiate

Synopsis

The command generates an active test alarm of the specified class, which is entered in the alarm log.

Alarm tests can be useful for validating the operation of hardware such as LEDS and alarm relays, as well as ensuring proper communication with an SNMP manager without impacting the operation of the system.

Syntax

```
ALTEI:{[CLA=5]|[CLA=4]|[CLA=3]};
```

Prerequisites

- Only one test alarm can be active at any one time. Test alarms can only be generated for classes 3 (critical), 4 (major) and 5 (minor).

Attributes

None

Examples

```
ALTEI:CLA=3;
```

6.4.8 ALTEE – Alarm Test End

Synopsis

Clears a test alarm.

Syntax

```
ALTEE;
```

Prerequisites

- The alarm test must already have been initiated.

Attributes

None

Examples

```
ALTEE;
```

6.5 Configuration Commands

The configuration commands include:

- CNBOI - Configuration Board Initiate
- CNBOE - Configuration Board End
- CNBOP - Configuration Board Print
- CNBUI - Configuration Back Up Initiate
- CNMOI - Configuration Monitor Initiate
- CNMOE - Configuration Monitor End
- CNMOP - Configuration Monitor Print
- CNOBP - Display TRAP Configuration
- CNOBS - Set TRAP Configuration
- CNPCI - Configuration PCM Initiate
- CNPCC - Configuration PCM Change
- CNPCE - Configuration PCM End
- CNPCP - Configuration PCM Print
- CNRDI - Configuration Remote Data Center Initiate
- CNRDC - Configuration Remote Data Center Change
- CNRDE - Configuration Remote Data Center End
- CNRDP - Configuration Remote Data Center Print
- CNSMC - Change SNMP Manager Configuration
- CNSME - End SNMP Manager Configuration
- CNSMI - Set SNMP Manager Configuration
- CNSMP - Display SNMP Manager Configuration
- CNSNS - Configuration SNMP Set
- CNSNP - Configuration SNMP Print
- CNSWP - Configuration Software Print
- CNSYS - Configuration System Set
- CNSYP - Configuration System Print
- CNTDS - Configuration Time and Date Set
- CNTDP - Configuration Time And Date Print
- CNTOS - Configuration Timeout Value Set
- CNTOP - Configuration Timeout Value Print
- CNTPE - Configuration Network Time Protocol Server End
- CNTPI - Configuration Network Time Protocol Server Initiate
- CNTPP - Configuration Network Time Protocol Print
- CNTSP - Configuration Timeslot Print
- CNUPI - Configuration Update Initiate
- CNUSC - Change SNMP v3 User Configuration
- CNUSE - End SNMP v3
- CNUSI - Set SNMP v3
- CNUSP - Display SNMP v3
- CNXCI - Configuration Cross Connect Initiate
- CNXCE - Configuration Cross Connect End
- CNXCP - Configuration Cross Connect Print

6.5.1 CNBOI – Configuration Board Initiate

Synopsis

This command defines a new board on the system.

The user should specify the board position (BPOS) within the unit, the physical type of the board (BRDTYPE) and the signaling type (SIGTYPE), which identifies the software that will run on the board.

See Section 7.1.2, “Boards and PCMs” on page 136 for a more detailed description of board configuration.

Syntax

```
CNBOI:BPOS=,BRDTYPE=,SIGTYPE=;
```

Prerequisites

- No board has already been defined for the specified board position.
- A board must physically exist for the board position and be licensed for the Signaling Gateway.
- If you are using a Dialogic® DSI SS7HDP Network Interface Board, it must have a signaling type of SS7.

Attributes

CONFIG

Examples

```
CNBOI:BPOS=1,BRDTYPE=SPCI4-4-4,SIGTYPE=SS7;
CNBOI:BPOS=1,BRDTYPE=SPCI2S-4-2,SIGTYPE=SS7;
CNBOI:BPOS=3,BRDTYPE=SS7HDP-64-4,SIGTYPE=SS7;
```

6.5.2 CNBOE – Configuration Board End

Synopsis

This command deassigns a board from a board position.

Syntax

```
CNBOE:BPOS=;
```

Prerequisites

- A board has been defined for the specified board position.
- No signaling processor on the board has been allocated to a signaling link.
- No PCM on the board is configured.
- The board has been blocked.

Attributes

CONFIG

Examples

```
CNBOE:BPOS=3;
```

6.5.3 CNBOP – Configuration Board Print

Synopsis

This command gives a print out of all configured boards.

Syntax

```
CNBOP;
```

Prerequisites

None

Attributes

None

Examples

```
CNBOP;
```

Output Format

```
Board Configuration
BPOS  BRDTYPE     SIGTYPE
1     SPCI2S-4-2  SS7
3     SPCI2S-4-2  SS7
EXECUTED
```

6.5.4 CNBUI – Configuration Back Up Initiate

Synopsis

This command backs up either the configuration data or the current software distribution to a Remote Data Center (RDC).

A filename (FILE) should be entered on the command line without a suffix. The command automatically reads the filename with a suffix. The command determines the suffix from the DTYPE parameter. For example, if the user specifies FILE=CFG and DTYPE=CONFIG, the full filename would be CFG.CF4.

The file suffix and default filename for each DTYPE is as follows:

- For DTYPE=CONFIG, the filename suffix is .CF3. If a filename is not specified, the default is “SDC”.
- For DTYPE=SOFTWARE, the filename suffix is .tgz. If a filename is not specified, the default is “sgw”.

Optionally, the file may be backed up to a subdirectory (DIRECTORY) of the account on the RDC.

> ***Note:*** During execution of this command, the system may not respond for up to three minutes while the command is being executed.

Syntax

```
CNBUI:RDC=,DTYPE=,[FILE=,][DIRECTORY=,];
```

Prerequisites

- The RDC should be initiated and not blocked.
- The DTYPE can only be CONFIG or SOFTWARE.
- If the RDC is the “local” RDC, a FILE name of SDC or SGW is not allowed.

Attributes

None

Examples

```
CNBUI:RDC=1,DTYPE=CONFIG,FILE=SDC;
```

6.5.5 CNMOI – Configuration Monitor Initiate

Synopsis

This command initiates the monitoring of an object on the Signaling Gateway. An object is currently a C7LINK.

For signaling, the STS monitors information sent from the EQU of the signaling link and the RTS monitors information received by the signaling link.

Syntax

```
CNMOI:C7LINK=,STS=,RTS=;
```

Prerequisites

- If specified, the C7LINK has already been initiated and must have a TS and EQU.
- The PCM on which STS exists must have already been initiated and STS must be within the correct range for the PCM type (0 to 31 for E1 and 1 to 24 for T1 PCMs).
- The PCM on which RTS exists must have already been initiated and RTS must be within the correct range for the PCM type (0 to 31 for E1 and 1 to 24 for T1 PCMs).
- STS is not already assigned elsewhere on the system for output.
- RTS is not already assigned elsewhere on the system for output.
- A signaling link can only be monitored once.

Attributes

CONFIG

Examples

```
CNMOI:C7LINK=1,STS=3-3-15,RTS=5-3-16;
```

6.5.6 CNMOE – Configuration Monitor End

Synopsis

This command ends the monitoring of an object. An object is currently only an signaling link.

Syntax

```
CNMOE:C7LINK=;
```

Prerequisites

- The C7LINK is being monitored.

Attributes

CONFIG

Examples

```
CNMOE:C7LINK=1;
```

6.5.7 CNMOP – Configuration Monitor Print

Synopsis

This command is used to obtain a print out of the objects being monitored. An object is currently only a signaling link.

For signaling, the STS monitors information sent from the EQU of the signaling link and the RTS monitors information received by the signaling link.

Syntax

```
CNMOP;
```

Prerequisites

None

Attributes

None

Examples

```
CNMOP;
```

Output Format

```
Monitoring Configuration
C7LINK STS    RTS
1      3-3-1  3-3-2
3      3-3-3  3-3-4
EXECUTED
```

+++

6.5.8 CNOBP – Display TRAP Configuration

Synopsis

This command displays the current TRAP configuration. The entire TRAP configuration for all available objects will be displayed if no object group is specified. The list of available objects will depend on the current system mode configuration (i.e. SIU, DSC or SG). If the objgrp parameter is specified, CNOBP will display settings for only that object group. The CNOBS command allows the TRAP configuration to be changed.

Syntax

```
CNOBP[:OBJGRP=];
```

Prerequisites

The DSMI-based SNMP agent must be enabled.

Attributes

None.

Examples

```
CNOBP;
CNOBP:OBJGRP=3;
```

Output Format

```
Configuration SNMP Traps
OBJGRP OBJECT  UP       DOWN     INACTIVE IMPAIR   RESTART  QUIESCE  WARNING
1      1       CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE
1      2       CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE
1      3       CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE
2      1       CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE
2      2       CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE
2      3       CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE
2      4       CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE
3      1       CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE
3      2       CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE
3      3       CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE
3      4       CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE
3      5       CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE
4      1       CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE
5      1       CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE
5      2       CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE
6      1       CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE
6      2       CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE
6      3       CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE
7      1       CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE
7      2       CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE
7      3       CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE   CHANGE
EXECUTED
```

6.5.9 CNOBS – Set TRAP Configuration

Synopsis

This command allows a user to determine the conditions under which an SNMP TRAP will be generated for a particular DSMI object.

Essentially, a TRAP can be generated:

- "When any row within an object changes state (CHANGE)
- "When a new row (with a particular state) is created within an object (CREATE)
- "When a row (with a particular state) is destroyed within an object (DESTROY)
- "When any combination of the above occur (ALL), or when an event occurs that affects the alarm condition of the object, but does not necessarily change the state.

TRAPs can also be completely disabled (NONE).

Possible states that a DSMI object can transition into are:

UP	Operational and available
DOWN	Not available
INACTIVE	Operational but not available
IMPAIR	Operational and available but encountering service-affecting condition (e.g. congestion).
RESTART	Unavailable but will soon be available
QUIESCE	Operational but in the process of shutting down/being removed
WARNING	Operational and available but encountering a non service-affecting condition

Only one state's TRAP configuration can be configured per single invocation of this command.

The CNOBP command displays the current TRAP configuration for each object.

These TRAP messages are sent to SNMP managers, which are defined with the CNSMI command. The default setting for all object states is CHANGE.

Syntax

```
CNOBS:OBJGRP=,OBJECT=[,UP=]|[,DOWN=]|[,INACTIVE=]|[,IMPAIR=]|[,RESTART=]|[,QUIESCE=,]|[,WARNING=];
```

Prerequisites

The DSMI-based SNMP agent must be enabled.

Attributes

CONFIG

Examples

CNOBS:OBJGRP=7,OBJECT=2,DOWN=all;

This will cause a TRAP to be generated whenever an SS7 link is created in the Down state, or destroyed while in the Down state or when the link enters the Down state.

6.5.10 CNPCI – Configuration PCM Initiate

Synopsis

This command configures a PCM (PCM) for T1 or E1 operation (PCMTYPE) on a board such that it is available for signaling or voice. The command optionally configures the PCM to be used as a potential synchronization source for the system (SYNCPRI). The command also allows the frame format (FF) and line code (LC) to be configured. See Section 7.1.2, “Boards and PCMs” on page 136 for a more detailed description of PCM configuration.

Syntax

```
CNPCI:PCM=,PCMTYPE=,[SYNCPRI=,][FF=,][LC=,][IDLE=][BM=][BUILDOUT=,] [UNS=,];
```

Prerequisites

- The board on which the PCM exists has been initiated.
- The PCM has not already been initiated.
- For a PCMTYPE of E1, the LC can be set to HDB3 and the FF can be set to G704, CRC4, CRC4C or CRC4G706.
- For a PCMTYPE of T1, the LC can be set to AMI or B8ZS and the FF can be set to SF, ESF or CRC6.
- An FF of CRC4G706 can only be set on a board type of SS7HDP.
- The BUILDOUT parameter can only have a value of 0 for E1 and a value of 1 for T1s on boards of a type other than SS7HDP.
- A frame format of UNS can only be specified for PCMs on SS7HDP signaling boards.

Attributes

CONFIG

Examples

```
CNPCI:PCM=1-1,PCMTYPE=E1,SYNCPRI=1;
```

6.5.11 CNPCC – Configuration PCM Change

Synopsis

This command allows changes to the configuration of a PCM.

Syntax

```
CNPCC:PCM=,{[PCMTYPE=,]|[SYNCPRI=,][FF=,][LC=,][IDLE=][BM=][BUILDOUT=,]};
```

Prerequisites

- The PCM has already been initiated.
- For a PCMTYPE of E1, the LC can be set to HDB3 and the FF can be set to G704, CRC4, CRC4C or CRC4G706.
- For a PCMTYPE of T1, the LC can be set to AMI or B8ZS and the FF can be set to SF, ESF or CRC6.
- An FF of CRC4G706 can only be set on a Dialogic® DSI SS7HDP Network Interface Board.
- The frame format (FF) value cannot be changed to or from UNS using this command - use CNPCI.
- The BUILDOUT parameter can only have a value of 0 for E1 and a value of 1 for T1s on boards of a type other than SS7HDP.

Attributes

CONFIG

Examples

```
CNPCC:PCM=1-1,SYNCPRI=3;
```

6.5.12 CNPCE – Configuration PCM End

Synopsis

This command ends the configuration of a PCM such that it is unavailable for voice or signaling.

Syntax

```
CNPCE:PCM=;
```

Prerequisites

- No timeslot on the PCM has been assigned to voice, signaling monitoring or cross connections.
- The board on which the PCM exists has been blocked.

Attributes

CONFIG

Examples

```
CNPCE:PCM=1-1;
```

6.5.13 CNPCP – Configuration PCM Print

Synopsis

This command gives a printout of all the configured PCMs.

Syntax

```
CNPCP;
```

Prerequisites

None

Attributes

None

Examples

```
CNPCP;
```

Output Format

```
PCM Configuration
PCM     PCMTYPE LC      FF      SYNCPRI IDLE  BUILDOUT
1-2     E1      HDB3    G704    6       2A    0
2-2     E1      HDB3    G704    1       2A    0
3-1     T1      B8ZS    SF      2       2A    7
 EXECUTED
```

6.5.14 CNRDI – Configuration Remote Data Center Initiate

Synopsis

This command is used to configure Remote Data Center (RDC) so that data from periodic report or continuous recording can be transferred to that location. The connection itself is established when the RDC is unblocked.

An RDC is an account, with an FTP logon name (USER) and password (PASSWORD) on a remote system (IPADDR) operating as an FTP server. No proprietary software is required to run on the remote system.

Note: If an RDC has previously been ended, but a file transfer was already in progress, subsequent CNRDIs using that RDC fail with “NO SYSTEM RESOURCES” until the file transfer has completed.

To configure the Signaling Gateway to act itself as an RDC, the user must specify a local address (127.0.0.1) together with the “siuftp” account name and password.

Note: Local operation functions only if the ftp server on the system is active.

Syntax

```
CNRDI:RDC=,IPADDR=,USER=,PASSWORD=,[LABEL=,];
```

Prerequisites

- The RDC is not already initiated.
- The IP address is not already in use.

Attributes

CONFIG

Examples

```
CNRDI:RDC=1,IPADDR=255.123.0.124,USER=JOHN,PASSWORD=BAZZA123;
```

6.5.15 CNRDC – Configuration Remote Data Center Change

Synopsis

This command is used to change the configuration of a Remote Data Center (RDC).

Syntax

```
CNRDC:RDC=,{[IPADDR=,][USER=,][PASSWORD=,][LABEL=,]};
```

Prerequisites

- The RDC is already initiated and blocked.
- If specified, the IP address is not already in use.
- Remote data operation must be allowed by the system.

Attributes

CONFIG

Examples

```
CNRDC:RDC=1,IPADDR=194.192.184.77,USER=JOHN,PASSWORD=BAZZA23;
```

6.5.16 CNRDE – Configuration Remote Data Center End

Synopsis

This command is used to end a Remote Data Center (RDC).

Syntax

```
CNRDE:RDC=;
```

Prerequisites

- The RDC is already initiated.
- The RDC is blocked.
- The RDC is not attached to a continuous record or periodic report.

Attributes

CONFIG

Examples

```
CNRDE:RDC=1;
```

6.5.17 CNRDP – Configuration Remote Data Center Print

Synopsis

This command is used to print out the Remote Data Center parameters.

The password is not printed.

Syntax

```
CNRDP;
```

Prerequisites

None

Attributes

None

Examples

```
CNRDP;
```

Output Format

```
Remote Data Centre Configuration
RDC  IPADDR           USER         PASSWORD      LABEL
1    194.192.184.33   JOHN         ********      PRIMARY
2    127.0.0.1        siuftp       ********      Local
EXECUTED
```

6.5.18 CNSMC – Change SNMP Manager Configuration

Synopsis

This command allows the administrator to alter an SNMP manager's configuration. The parameters and the associated values are as per the CNSMI command.

Syntax

```
CNSMC:MNGR={,IPADDR=|,TFORMAT=|,PORT=|,TCOM=|,USER=|,ENGINE=|,LABEL=};
```

Prerequisites

The DSMI-based SNMP agent must be enabled.

The manager must already have been defined with the CNSMI command.

If an SNMP v3 user is specified, the user must already be defined.

Attributes

CONFIG

Examples

```
CNSMC:MNGR=1,IPADDR=192.168.220.222;
```

6.5.19 CNSME – End SNMP Manager Configuration

Synopsis

This command removes an SNMP manager definition from the list of configured SNMP managers. The command takes a single parameter, MNGR, which identifies the particular manage to remove.

Syntax

```
CNSME:MNGR=;
```

Prerequisites

The DSMI-based SNMP agent must be enabled.

The manager must already have been defined with the CNSMI command.

Attributes

CONFIG

Examples

```
CNSME:MNGR=1;
```

6.5.20 CNSMI – Set SNMP Manager Configuration

Synopsis

This command allows the administrator to define up to 32 TRAP destinations (i.e. remote SNMP manager stations). Each manager is defined by its IP address (IPADDR). Additionally, the type of TRAP to be dispatched to the SNMP manager is specified with the TFORMAT parameter. The following values are supported:

1	An SNMP v1 TRAP is sent
2	An SNMP v2 TRAP is sent
3	An SNMP v2 INFORM is sent

The PORT parameter allows the user to configure a destination port which is different to the default standard SNMP TRAP port (162).

If the remote SNMP (v1 or v2c) manager has been configured to only recognize TRAPs received with a community string, the TCOM parameter accommodates that value.

If an SNMP v3 TRAP is to be issued, then the USER parameter value is used. The USER parameter is used to specify a user, which has been defined with the CNUSI command. Furthermore, it will also be necessary to configure an engine identifier, which has been configured on the remote SNMP manager. The engine identifier is configured with the ENGINE parameter.

Finally, the LABEL parameter is used to specify an optional string identifier for the manager.

Syntax

```
CNSMI:MNGR=,IPADDR=,TFORMAT=[,PORT=][,TCOM=][,USER=][,ENGINE=][,LABEL=];
```

Prerequisites

The DSMI-based SNMP agent must be enabled. If an SNMP v3 TRAP is required, the user referenced by the USER parameter must exist.

Attributes

CONFIG

Examples

This is an example for setting up a simple SNMP v2 TRAP receiver/manager:

```
CNSMI:MNGR=1,IPADDR=192.168.1.22,TFORMAT=2;
```

This next example shows how an SNMP v3 TRAP receiver/manager would be created. The first step is to define the user with the CNUSI command:

```
CNUSI:USER=1,AUTH=MD5,AUTHPASS=abcdefgh,LABEL=user1;
EXECUTED
```

The next step is to define the manager which references the user which has just been defined:

```
CNSMI:MNGR=2,IPADDR=192.168.1.222,USER=1,ENGINE=1122334455;
EXECUTED
```

6.5.21 CNSMP – Display SNMP Manager Configuration

Synopsis

This command displays the currently configured SNMP managers. If a MNGR value is specified, only that manager is displayed.

Syntax

```
CNSMP [:MNGR=];
```

Prerequisites

The DSMI-based SNMP agent must be enabled.

Attributes

None.

Examples

```
CNSMP;
```

Output Format

```
Configuration SNMP Manager
MNGR  IPADDR           PORT TFORMAT TCOM      USER  ENGINEID  LABEL
1     192.168.220.192   162  1                 0
EXECUTED
```

6.5.22 CNSNS – Configuration SNMP Set

Synopsis

This command is used to select an SNMP agent or to disable SNMP. Changing the SNMP parameter with the CNSNS command will require a system restart for the changes to take effect. The SNMP parameter value can be one of three values. Setting the SNMP value to DK4032 will activate the legacy SNMP support. Setting the SNMP value to DSMI will activate the enhanced, DSMI-based agent if there is a valid license on the server. Finally, SNMP can be disabled altogether by specifying a value of NONE.

Note: When the DSMI-based SNMP agent is enabled initially, the RCOM string is assigned a value of 'public' and the WCOM string a value of 'private'. Unlike the legacy SNMP agent (SNMP=DK4032), there is no support for SNMP requests without a community string.

Syntax

```
CNSNS:SNMP=,[RCOM=,CONFIRM=],[WCOM=,CONFIRM=];
```

Prerequisites

Before DSMI SNMP functionality can be activated, the unit must be equipped with a license supporting DSMI SNMP functionality.

Example

```
CNSNS:SNMP=DSMI,RCOM=rcomstring,CONFIRM=rcomstring;
```

6.5.23 CNSNP – Configuration SNMP Print

Synopsis

This command displays the current SNMP mode, including the read and, where applicable, the write community string. The current SNMP agent, however, does not support write access. The output of this command can be used to determine which, if any, SNMP agent is currently activated on the Server. In the case of the enhanced DSMI-based agent, the SNMP setting will be DSMI. In the case of the legacy SNMP support, the value is DK4032. Additionally, if SNMP is not currently activated, a value of NONE will be displayed.

Syntax

```
CNSNP;
```

Prerequisites

None

Attributes

None

Example

```
CNSNP;
```

Output Format

```
SNMP Configuration
SNMP DSMI
RCOM ********
WCOM ********
EXECUTED
```

6.5.24 CNSWP – Configuration Software Print

Synopsis

This command is used print out the version numbers of the software operating on the main CPU and signaling boards within a Signaling Gateway. The command also displays the library version numbers for each protocol configured on the unit.

Syntax

```
CNSWP;
```

Prerequisites

None

Attributes

None

Output Format

```
Software Configuration
SS7G20      V3.02

Board Codefiles
SYS   SPCI  V1.16

Protocol Libraries
MTP3  CPU   V5.01
MTP2  SPCI  V5.03
EXECUTED
```

6.5.25 CNSYS – Configuration System Set

Synopsis

This command is used to enter the system identity string, personality setting, system reference number, and to turn on and off certain features and signaling systems on the Signaling Gateway.

The user can specify whether they wish to allow ftp access to the Signaling Gateway by using the FTPSER parameter. The Signaling Gateway can act as an ftp server to allow update of configuration, software and purchasable licenses. For security, it is recommended that ftp server access is switched off when the user does not need to execute these functions. The user can disable FTPSER by setting the parameter to N. Activation or deactivation of the ftp server takes immediate effect.

The user can specify whether they wish to restrict access to the Signaling Gateway so that it operates only over secure shell (SSH) by using the SECURE parameter. By default, there is no restriction allowing the use normal telnet and ftp access. The user can enable SECURE operation by setting the parameter to Y. Activation or deactivation of SECURE operation takes immediate effect.

When a password is specified, all new MML sessions apart from serial port 2 (COM2) require a password before entry.

The personality parameter is used to select customer-specific, non-standard operating functionality for the Signaling Gateway. To achieve the standard operating functionality, the personality should be set to the default value (that is, zero). Unless otherwise notified, all customers should select the standard operating functionality.

The M3UASHARE parameter determines the percentage of the licensed throughput capacity allocated to the M3UA protocol - the remainder being allocated to M2PA.

For example, on a system equipped with the **SS7SBG30SGWJ** software license which allows up to 2460 Kilobytes/sec throughput, if the M3UASHARE parameter is set to a value of 25, then M3UA is allocated 615 (25%) Kilobytes/sec, and M2PA is allocated the remaining capacity. If M3UASHARE is blank then the total licensed capacity can be used by either M3UA or M2PA - but not both.

When M3UASHARE is blank only M3UA links or only M2PA links can be unblocked, but not both types. Before M3UASHARE can be set to 'blank' (i.e a value is removed), all SIGTRAN links must be blocked.

Following changes to the M3UASHARE parameter, the system RESTART REQUIRED alarm is invoked and the system should be restarted before the changes can take effect.

See Section 7.1.1, “System Configuration” on page 135 for a more detailed description of system configuration.

Syntax

```
CNSYS:{[SYSID=,]|[SYSREF=,]|[PER=,]|[SECURE=,]|[FTPSER=,]|[FTPPWD=,]|
[GATEWAY=,]|[CONTACT=,]|[LOCATION=,][M3UASHARE=,]}
CNSYS:PASSWORD=,CONFIRM=,
```

Prerequisites

- When changing the personality or activating/deactivating signaling protocols, all boards and groups within the system must be blocked.
- A password, if provided, must be confirmed using the CONFIRM parameter to ensure that the password has not been mistyped.
- The user cannot enter a PER parameter value that already exists in the system.
- Before M3UASHARE can be unset, i.e., **M3UASHARE=;** all SIGTRAN links must be blocked.
- After changes to the M3UASHARE parameter, the system must be reset before changes will become effective.

Attributes

CONFIG

Examples

```
CNSYS:SYSID=STATION1,PER=2;

CNSYS:M3UASHARE=60;

CNSYS:M3UASHARE=;
```

6.5.26 CNSYP – Configuration System Print

Synopsis

Software options not licensed on the unit do not appear in the list. Most of these configuration items are set using the CNSYS command, which also contains more details of other options. The “Password” value shows “*********” if a password is set and blank if a password is not set.

Syntax

```
CNSYP;
```

Prerequisites

None

Attributes

None

Examples

```
CNSYP;
```

Output Format

```
System Configuration
UNITID:     001e0dc74896
SYSID:      LDXCentre
SYSREF:     0
LOCATION:   Room5
CONTACT:    admint@email.com
PASSWORD:
FTPPWD:     N
FTPSER:     Y
SECURE:     N
PER:        0
M3UASHARE
EXECUTED
```

Note: The protocol and mode parameters are only present if licensed. When a protocol or mode is active, the parameter shows the value “Y”, and when inactive, the parameter shows the value “N”.

6.5.27 CNTDS – Configuration Time and Date Set

Synopsis

This command is used to specify the date (DATE) and time (TIME) as used by the system. This command can also activate or deactivate Network Time Protocol (NTP) on the system. System time is used by the Signaling Server to indicate the time an alarm occurred or cleared and to provide timestamps for such things as measurements and data records. The command also allows an OFFSET from UTC to be specified to allow the system to report the correct local time, when synchronized with an NTP time server.

Note: The system will not automatically adjust for daylight savings time changes.

See:

- The CNTDP command to verify the time and date settings.
- The CNTPI command to add NTP servers to the configuration.

Syntax

```
CNTDS:[DATE=,][TIME=,][NTP=,][OFFSET=];
```

Prerequisites

- The OFFSET value must be specified in hours and optionally 0 or 30 minutes, in the range -14 to +12. e.g.

Montreal, CANADA	-5:00
Parsippany, USA	-5:00
Fordingbridge, UNITED KINGDOM	0:00
Renningen, GERMANY	+1:00
New Delhi, INDIA	+5:30
Beijing, CHINA	+8:00
Sydney, AUSTRALIA	+10:00

  The unit must be restarted in order for the new OFFSET value to take effect.
- The date cannot be changed if periodic reports or continuous records are configured.

Attributes

CONFIG - The command affects configuration data.

Example

```
CNTDS:DATE=2001-10-03,TIME=18:32:21,NTP=Y,OFFSET=+5:30;
EXECUTED
```

6.5.28 CNTDP – Configuration Time And Date Print

Synopsis

This command is used to print out the system date and time, whether NTP is active and to display the OFFSET from UTC configured. See the CNTDS command for setting the time and date, UTC OFFSET and activating NTP.

Syntax

```
CNTDP;
```

Prerequisites

None.

Attributes

None.

Example

```
CNTDP;
Configuration Time and Date
DATE       TIME     NTP OFFSET
2001-10-03 09:04:02 Y   +5:30
```

6.5.29 CNTOS – Configuration Timeout Value Set

Synopsis

This command is used to change the value of a timer for a particular signaling system.

The user should specify the timer type (TTYPE), the timer itself (TO) and time to which it should be set, expressed in either seconds (TSEC) or milliseconds (TMSEC).

> ***Note:*** Some signaling system timer values are not changeable.

See the CNTOP command to verify timer values. See Section 5.3, “Signaling Gateway Timers” on page 46 for the definition of signaling system specific timers.

Syntax

```
CNTOS:TTYPE=,TO=,{TSEC=|TMSEC=};
```

Prerequisites

None

Attributes

CONFIG

Examples

```
CNTOS:TTYPE=MTP3,TO=7,TSEC=30;
```

6.5.30 CNTOP – Configuration Timeout Value Print

Synopsis

This command is used to print the value of either a single timer or all the timers for a particular protocol module. (Refer to CNTOS command to set timer values.)

Syntax

```
CNTOP:TTYPE=,[TO=,];
```

Prerequisites

None

Attributes

None

Examples

```
CNTOP:TTYPE=MTP3;
```

Output Format

```
Timeout Values:
TTYPE  TO    TSEC   TMSEC
MTP3   1     60
MTP3   2     360
MTP3   3     120
MTP3   4     360
MTP3   5     5
MTP3   6     5
MTP3   7     3
MTP3   10    60
EXECUTED
```

6.5.31 CNTPE – Configuration Network Time Protocol Server End

Synopsis

This command is used to remove an NTP Server from the configuration of the system.

Syntax

```
CNTPE:NTPSER;
```

Prerequisites

The specified NTPSER must already be configured.

Attributes

CONFIG - The command affects configuration data.

Example

```
CNTPE:NTPSER=1;
```

6.5.32 CNTPI – Configuration Network Time Protocol Server Initiate

Synopsis

This command is used to add an NTP server to the configuration of the system. The NTP service should be activated using the CNTDS command.

Syntax

```
CNTPI:NTPSER=,IPADDR=,[LABEL=];
```

Prerequisites

The specified NTPSER must not already be configured.

The IPADDR may not be used more than once and may not identify any of the configured system IP addresses.

Up to 16 NTP servers may be configured.

Attributes

CONFIG - The command affects configuration data.

Example

```
CNTPI:NTPSER=1,IPADDR=192.168.0.1,LABEL=NTPSERV1;
```

6.5.33 CNTPP – Configuration Network Time Protocol Print

Synopsis

This command is used to display the configuration of the Network Time Protocol software on the unit.

Syntax

```
CNTPP;
```

Prerequisites

None.

Attributes

None.

Example

```
CNTPP;
Configuration of NTP Servers
NTPSER IPADDR          LABEL
1      192.168.0.1     NTP server 1
2      192.168.0.2     NTP server 2
EXECUTED
```

6.5.34 CNTSP – Configuration Timeslot Print

Synopsis

This command is used to print the configuration of all timeslots on a PCM.

A timeslot on a PCM can be allocated to signaling, voice, cross connect, or monitoring or it can be unallocated. Data is printed for a timeslot when it is acting as an outgoing timeslot.

A timeslot can act as an outgoing timeslot for the following types:

- SIG - Carries signaling information. It forms a duplex connection.
- OTS - Acts as an outgoing timeslot for a cross connection. It may form a duplex connection.
- STS - The outgoing timeslot monitoring the send direction of an object.
- RTS - The outgoing timeslot monitoring the receive direction of an object.

Note: An object is currently only a signaling link.

For signaling, the STS monitors information sent from the EQU of the signaling link and the RTS monitors information received by the signaling link.

Syntax

```
CNTSP:PCM=;
```

Prerequisites

None

Attributes

None.

Examples

```
CNTSP:PCM=3-3;
```

Output Format

```
PCM Timeslot Configuration
TS       TYPE C7LINK ITS
3-3-22   SIG  6
3-3-24   OTS          4-4-4
3-3-25   RTS  7
3-3-25   STS  8
EXECUTED
```

6.5.35 CNUPI – Configuration Update Initiate

Synopsis

This command is used to update configuration data, software or a license on the Signaling Gateway. The operation involves reading files containing either configuration data, software or a license from a Remote Data Center (if specified) or portable media (CD or USB) and loading it into memory. Optionally, the file may be read from a subdirectory (DIRECTORY) of the account on the RDC.

A FILE name should be entered on the command line without a suffix. The command automatically reads the file name with a suffix. The command determines the suffix by use of the DTYPE parameter. For example, the file CFG.CF3 for a DTYPE of CONFIG would be entered as CFG.

The filename suffix for DTYPE=CONFIG is .CF3.

The filename suffix for DTYPE=SOFTWARE is .tgz.

The filename suffix for DTYPE=LICENSE is .lic.

If not specified, the default filename for a DTYPE=CONFIG is “SDC”.

If not specified, the default filename for a DTYPE=SOFTWARE is “sgw”.

If not specified, the default filename for a DTYPE=LICENSE is “sgw”.

> ***Note:*** During execution of this command, there system may not respond for up to 3 minutes while the command is being executed.

Syntax

```
CNUPI:DTYPE=,RDC=,[DIRECTORY=,][FILE=,];
```

Prerequisites

- If the RDC is specified, it should be initiated and not blocked.

Attributes

CONFIG

Examples

```
CNUPI:RDC=1,DTYPE=CONFIG,DIRECTORY=AUTH,FILE=CFG;
```

6.5.36 CNUSC – Change SNMP v3 User Configuration

Synopsis

This command allows the configuration of a previously registered SNMP v3 user to be changed. The USER parameter identifies the user account to modify.

The parameters and associated values are as per the CNUSI command, with the additional parameters PRIV and PRIVPASS. Supported PRIV parameter values are DES and AES. As with the AUTHPASS parameter value, the privacy password value (PRIVPASS) must be between 8 and 24 characters long. Also, it is not possible to configure or modify the PRIVPASS value for a user without also specifying the PRIV value. It is, however, possible to modify the PRIV or AUTH values without additionally specifying a corresponding password.

Syntax

```
CNUSC:USER=[,AUTH=|,AUTHPASS=|,PRIV=|,PRIVPASS=|,LABEL=};
```

Prerequisites

The DSMI-based SNMP agent must be enabled.

The SNMP v3 user must already have an entry in the list of configured SNMP v3 users.

Attributes

CONFIG

Examples

```
CNUSC:USER=3,AUTH=SHA;
```

6.5.37 CNUSE – End SNMP v3

Synopsis

This command removes an SNMP v3 user's configuration entry. The command takes a single parameter, USER, which identifies the user to be removed.

Syntax

```
CNUSE:USER=;
```

Prerequisites

The DSMI-based SNMP agent must be enabled.

The user must be present in the list of configured SNMP v3 users.

Attributes

CONFIG

Examples

```
CNUSE:USER=3;
```

6.5.38 CNUSI – Set SNMP v3

Synopsis

This command allows the administrator to create SNMP v3 user accounts that are recognized by the local server. It also allows the administrator to define SNMP v3 user accounts for use in conjunction with SNMP v3 TRAP destinations/managers.

A user is defined with an integer user identifier (USER), optional authentication (AUTH/AUTHPASS) and a label (LABEL), which serves as the username. The USER and LABEL parameters are mandatory. Supported AUTH values are SHA and MD5. The password must have a minimum length of 8 characters, and a maximum length of 24 is enforced. The AUTH and AUTHPASS parameters must be specified together. In other words, it is not possible to configure an AUTHPASS value without having also specified the AUTH value.

Note that only the authentication attributes can be defined with the CNUSI command. If a user requires privacy (encryption) parameters to be applied, the CNUSC command is used to configure them.

Syntax

```
CNUSI:USER=[,AUTH=,AUTHPASS=],LABEL=;
```

Prerequisites

- The DSMI-based SNMP agent must be enabled.

Attributes

CONFIG

Examples

```
CNUSI:USER=3,AUTH=MD5,AUTHPASS=user3pass,LABEL=user3;
```

6.5.39 CNUSP – Display SNMP v3

Synopsis

This command displays the current list of configured SNMP v3 users. The passwords are hidden. If a USER value is specified with the command, only that user's details are displayed.

Syntax

```
CNUSP[:USER=];
```

Prerequisites

The DSMI-based SNMP agent must be enabled.

Attributes

None.

Examples

```
CNUSP;
```

Output Format

```
Configuration SNMP Users
USER  AUTH  AUTHPASS  PRIV  PRIVPASS  LABEL
1     MD5   ********  NONE            user1
2     SHA   ********  NONE            user2
EXECUTED
```

6.5.40 CNXCI – Configuration Cross Connect Initiate

Synopsis

This command initiates a cross connect path across the Signaling Gateway between 2 PCM timeslots; the incoming timeslot (ITS) and the outgoing timeslot (OTS). If DUPLEX is not set to Y, a simplex cross connect is initiated from ITS to OTS.

Syntax

```
CNXCI:OTS=,ITS=,[DUPLEX=];
```

Prerequisites

- The PCM on which the OTS exists must have already been initiated and the OTS must be within the correct range for the PCM type (0 to 31 for E1 and 1 to 24 for T1 PCMs).
- The PCM on which the ITS exists must have already been initiated and the ITS must be within the correct range for the PCM type (0 to 31 for E1 and 1 to 24 for T1 PCMs).
- OTS is not already assigned elsewhere on the system for output.
- ITS is not already assigned elsewhere on the system for input.

Attributes

CONFIG

Examples

```
CNXCI:OTS=1-1-16,ITS=2-1-16,DUPLEX=Y;
```

6.5.41 CNXCE – Configuration Cross Connect End

Synopsis

This command ends a Cross Connect connection across the converter.

Syntax

```
CNXCE:OTS=,[DUPLEX=,];
```

Prerequisites

- The OTS must already be initiated as an OTS in a Cross Connect connection path.
- If DUPLEX=Y is specified, a duplex connection must already exist for the specified OTS.

Attributes

CONFIG

Examples

```
CNXCE:OTS=1-1-16;
```

6.5.42 CNXCP – Configuration Cross Connect Print

Synopsis

This command is used to obtain a printout of Cross Connect connection path(s).

Syntax

```
CNXCP:PCM=;
CNXCP:OTS=;
CNXCP;
```

Prerequisites

None

Attributes

None

Examples

```
CNXCP:PCM=1-2;
CNXCP:OTS=1-1-16;
CNXCP;
```

Output Format

```
Path Configuration
OTS      ITS      DUPLEX
1-1-16   2-1-16   Y
EXECUTED
```

6.6 SS7 Signaling Commands

The SS7 signaling commands include:

- C7LSI - CCS SS7 Link Set Initiate
- C7LSC - CCS SS7 Link Set Change
- C7LSE - CCS SS7 Link Set End
- C7LSP - CCS SS7 Link Set Print
- C7RTI - CCS SS7 Route Initiate
- C7RTC - CCS SS7 Route Change
- C7RTE - CCS SS7 Route End
- C7RTP - CCS SS7 Route Print
- C7SLI - CCS SS7 Signaling Link Initiate
- C7SLC - CCS SS7 Signaling Link Change
- C7SLE - CCS SS7 Signaling Link End
- C7SLP - CCS SS7 Signaling Link Print

6.6.1 C7LSI – CCS SS7 Link Set Initiate

Synopsis

This command is used to initiate the SS7 link set (LS) between the point code of the unit, the Originating Point Code (OPC), and an adjacent point code, the Destination Point Code (DPC). The user should specify the maximum number of links in the link set (LSSIZE), the SS7 Signaling mode (SS7MD), which identifies the point code size and mode of operation, and the Network Context (NC) the link set exists within.

See Section 7.2, “Signaling Configuration” on page 137 for a more detailed description of the SS7 Signaling configuration.

This command is used to initiate the SS7 link set. Note that the DPC (Destination Point Code) is the adjacent Point Code for the link set.

Syntax

```
C7LSI:LS=,OPC=,DPC=,LSSIZE=,NI=,SS7MD=,NC=,;
```

Prerequisites

- The SS7 link set has not already been initiated.
- The SS7MD associated with a NC cannot be different to an SS7MD associated with the same NC anywhere else in the system.
- The NC/DPC combination must be different for all link sets.
- If SS7MD indicates 14-bit Point Code, OPC and DPC must be less than or equal to 16383.
- If SS7MD indicates 16-bit Point Code, OPC and DPC must be less than or equal to 65535.
- Only one OPC can exist within a network context.

Attributes

CONFIG

Examples

```
C7LSI:LS=1,NC=1,OPC=1,DPC=2,LSSIZE=2,SS7MD=ITU14,NI=0;
```

6.6.2 C7LSC – CCS SS7 Link Set Change

Synopsis

This command allows changes to the configuration of an SS7 link set.

Syntax

```
C7LSC:LS=,{[OPC=,][DPC=,][LSSIZE=,][NC=,][NI=,]};
```

Prerequisites

- The SS7 link set has already been initiated.
- All configured SS7 links must be blocked.

  Note: After blocking, an SS7 link cannot be unblocked until all the boards processing the SS7 signaling are blocked and then unblocked.
- The LSSIZE cannot be set to less than the number of links attached to the link set.
- DPC must be different across link sets.
- If SS7MD indicates a 14-bit Point Code, OPC and DPC must be less than or equal to 16383.
- Only one OPC can exist within a network context.
- The NC/DPC combination must be different for all link sets.
- The NC/OPC combination must be different for all link sets.

Attributes

CONFIG

Examples

```
C7LSC:LS=1,OPC=1,DPC=2,LSSIZE=2;
```

6.6.3 C7LSE – CCS SS7 Link Set End

Synopsis

This command is used to end the SS7 link set.

Syntax

```
C7LSE:LS=;
```

Prerequisites

- There should be no signaling links attached to the link set.
- All configured SS7 links within the system must be blocked.

  Note: After blocking, an SS7 link cannot be unblocked until all the boards processing the SS7 signaling are blocked and then unblocked.
- There are no C7 Routes using this link set.

Attributes

CONFIG

Examples

```
C7LSE:LS=1;
```

6.6.4 C7LSP – CCS SS7 Link Set Print

Synopsis

This command obtains a printout of the attributes for the SS7 link set. If no link is specified, the values for all link sets are shown.

Syntax

```
C7LSP:[LS=,];
```

Prerequisites

None

Attributes

None

Examples

```
C7LSP;
```

Output Format

```
CCS SS7 Link Set
LS      NC      OPC      DPC      NI      LSSIZE  SS7MD
1       1       1        3        2       2       ITU14
2       2       2        4        0       2       ANSI
EXECUTED
```

6.6.5 C7RTI – CCS SS7 Route Initiate

Synopsis

This command is used to initiate an SS7 Route (C7RT) to a Destination Point Code (DPC) within a Network Context (NC). An SS7 Route utilizes one (LS1) or two (LS2) link sets which route via adjacent point codes to reach the eventual destination (DPC).

On a per network context basis, a default MTP route may be specified. On a per network context basis, traffic for all point codes not known to the Gateway are routed to the default route. A default route can be specified by setting the DPC value on the route to DFLT.

See Section 7.2, “Signaling Configuration” on page 137 for a more detailed description of the SS7 signaling configuration.

Syntax

```
C7RTI:C7RT=,DPC=,LS1=,NC=,[LS2=,][LSH=,][LABEL=,];
```

Prerequisites

- The NC must be the same as the NC of the underlying link sets.
- The DPC/NC combination must be unique.
- The link set specified has already been initiated.
- If the route is to an adjacent point code, then all links in the linkset to that point code must be either inhibited or blocked.
- Only one default Route can be configured per Network Context.
- If a default route is specified, a network context cannot be configured with a DPC of 0.

Attributes

CONFIG

Examples

```
C7RTI:C7RT=1,LS1=1,DPC=130,LABEL=ROUTE130;
```

6.6.6 C7RTC – CCS SS7 Route Change

Synopsis

This command is used to change the attributes of an SS7 Route. The DPC parameter in this command supports an extra value 'DFLT'. When a route is specified as default, messages destined for DPCs within the network context that have not been configured by the system is sent to the default route.

Syntax

```
C7RTC:C7RT=,NC=,[DPC=,][LS1=,][LS2=,][LSH=,][LABEL=,];
```

Prerequisites

- If specified, LS2 must have same SS7MD, NI, NC, and OPC as LS1.
- If specified, LS1 must have same SS7MD, NI, NC, and OPC as LS2.
- The specified route has already been initiated.
- Any link set specified has already been initiated.
- The DPC/NC combination (associated with the route's link sets) must be different for each route.
- If changing any parameter other than the LABEL, all SS7 signaling links must be blocked.
  Note: After blocking, an SS7 link cannot be unblocked until all the boards processing the SS7 signaling are blocked and then unblocked.
- Only one default route can be configured per network context.
- If a default route is specified, a network context cannot be configured with a DPC of 0.

Attributes

CONFIG

Examples

```
C7RTC:C7RT=1,NC=1,LS1=2;
```

6.6.7 C7RTE – CCS SS7 Route End

Synopsis

This command is used to end an SS7 Signaling Route.

Syntax

```
C7RTE:C7RT=,NC=;
```

Prerequisites

- All SS7 signaling links must be blocked.

  Note: After blocking an SS7 link cannot be unblocked until all the boards processing the SS7 signaling are blocked and then unblocked.
- The specified route and NC combination has already been initiated.

Attributes

CONFIG

Examples

```
C7RTE:C7RT=1,NC=1;
```

6.6.8 C7RTP – CCS SS7 Route Print

Synopsis

This command shows the attributes of the specified SS7 Route or range of routes within a network context. If no route or network context is specified, the values for all routes are shown.

Syntax

```
C7RTP;
C7RTP:NC=;
C7RTP:C7RT=,NC=;
```

Prerequisites

None

Attributes

None

Examples

```
C7RTP;
```

Output Format

```
CCITT SS7 Signaling Route Configuration
C7RT    NC DPC      LS1     LS2     LSH     LABEL
1       1  2        1       3       Y       LONDON
2       1  3        2       4       N       EDINBURGH
3       1  DFLT     5               N       DEFAULT
1       2  66       12      13      N       BATH
EXECUTED
```

6.6.9 C7SLI – CCS SS7 Signaling Link Initiate

Synopsis

This command is used to initiate a SS7 Signaling Link (C7LINK).

The command allows the user to specify the signaling processor (EQU), Signaling Timeslot (TS) as well as which SS7 linkset (LS) the link belongs to. The user may alternatively specify an M2PA SIGTRAN link (SNLINK) instead of a processor and timeslot for communication of SS7 information. This command is also used to configure HSL links.

See Section 7.2, “Signaling Configuration” on page 137 for a more detailed description of the SS7 signaling configuration.

Syntax

```
C7SLI:C7LINK=,LS=,SLC=,EQU=,TS=,[M56K=,][PCR=,];
C7SLI:C7LINK=,LS=,SLC=,SNLINK=;
C7SLI:C7LINK=,LS=,SLC=,EQU=, M56K=,[PCR=,];
```

Prerequisites

- The specified link has not already been initiated.
- The specified PCM time slot is not already assigned elsewhere in the system.
- The PCM on which the timeslot exists has been initiated.
- The board on which the EQU exists has been initiated.
- The timeslot is a valid timeslot for the PCM type (up to 31 for an E1 PCM and 24 for a T1 PCM).
- The signaling processor specified by the EQU parameter must be equipped with a valid board type and not already assigned to a link.
- The link set has already been initiated.
- The board position specified by EQU must be blocked.

- If M56K is set to 3 or 4, the TS cannot be specified and if M56K is not set to 3 or 4, EQU must be specified.
- Only EQU signaling processors 1 and 2 can be used if M56K is 3 or 4.
- If an SNLINK is present, the EQU, TS, M56K and PCR cannot be present.
- If an SNLINK is specified, its SNTYPE must be M2PA.
- If an SNLINK is specified, it must be initiated, blocked and cannot be associated with any other SS7 link.
- Either a SNLINK or EQU must be present.
- SS7 links can use signaling processors 1 to 4 on a Dialogic® DSI SPCI4 or SPCI2S Network Interface Board or 1 to 64 on a Dialogic® DSI SS7HDP Network Interface Board.

Attributes

CONFIG

Examples

```
C7SLI:C7LINK=4,EQU=3-1,TS=3-3-17,LS=1,SLC=5;
C7SLI:C7LINK=5,SNLINK=1,LS=2,SLC=0;
C7SLI:C7LINK=2,EQU=1-33,TS=1-2-0,LS=1,SLC=1,M56K=0,HSL=Y
```

6.6.10 C7SLC – CCS SS7 Signaling Link Change

Synopsis

This command is used to change the attributes of an SS7 signaling link.

Syntax

```
C7SLC:C7LINK=,{[EQU=,][SNLINK=,][TS=,][M56K=,][PCR=,]};
```

Prerequisites

- The specified link has already been initiated.
- The specified PCM time slot is not already assigned elsewhere in the system.
- The PCM on which the timeslot exists has been initiated.
- If specified, the board on which the EQU exists has been initiated.
- If specified, the PCM on which the timeslot exists has been initiated.
- The timeslot is a valid timeslot number for the PCM type (up to 31 for a E1 PCM and 24 for a T1 PCM).
- The signaling processor specified by the EQU parameter must be equipped with a valid board type and not already assigned to a link.
- All links within the link set must be blocked.
- If the EQU, PCR or M56K parameters are specified the link must be blocked and C7 links EQU board must be blocked. To change the other parameters on the C7 link, the link must be inhibited.
- If M56K is set to either 1 or 2, all links on the same board for which M56K is set to 1 or 2 must also use the same M56K value (that is, only one mode of 56kbits/s operation is supported on any board at one time. However, it is possible for some links to operate at 64kbits/s, while others operate at 56kbits/s).
- The signaling processor specified by the EQU parameter must be equipped with a valid board type and not already assigned to a link.
- All links within the link set must be blocked.

  Note: After blocking, an SS7 link cannot be unblocked until all the boards processing the SS7 signaling are blocked and then unblocked.
- If the EQU, PCR or M56K parameters are specified, the link must be blocked and the C7 link's EQU board must be blocked. To change the other parameters on the C7 link, the link must be inhibited.
- If M56K is set to 3 or 4, the TS cannot be specified and if M56K is not set to 3 or 4, the EQU must be specified.
- Only EQU signaling processors 1 and 2 can be used if M56K is 3 or 4.
- If an SNLINK is present, the EQU, TS, M56K and PCR cannot be present.

- If an SNLINK is specified, it's SNTYPE must be M2PA.
- If an SNLINK is specified, it must be initiated, blocked and cannot be associated with any other SS7 link.
- The command cannot change between SNLINK and EQU type C7LINKs.
- SS7 links can use signaling processors 1 to 4 on a Dialogic® DSI SPCI4 or SPCI2S Network Interface Board or 1 to 64 on a Dialogic® DSI SS7HDP Network Interface Board.

Attributes

CONFIG

Examples

```
C7SLC:C7LINK=4,EQU=2-3,TS=3-3-16,M56K=1;
```

6.6.11 C7SLE – CCS SS7 Signaling Link End

Synopsis

This command is used to end an SS7 signaling link.

Syntax

```
C7SLE:C7LINK=;
```

Prerequisites

- The signaling link must be blocked.
- The signaling link must not be monitored.

Attributes

CONFIG

Examples

```
C7SLE:C7LINK=1;
```

6.6.12 C7SLP – CCS SS7 Signaling Link Print

Synopsis

This command is used to obtain a printout of the attributes of SS7 signaling link(s). If no link is specified, all initialized links are output.

Syntax

```
C7SLP:[C7LINK=…];
```

Prerequisites

None

Attributes

None

Examples

```
C7SLP:C7LINK=1;
C7SLP;
```

Output Format

```
Signaling Link Configuration
C7LINK  EQU     TS      SNLINK  LS      SLC     M56K    PCR
1       1-1     1-3-16          1       0       0       N
2       1-2     2-3-16          1       1       0       N
3                       1   2       0       0       N
4                       2   2       1       0       N
EXECUTED
```

6.7 IP Commands

The IP commands include:

- IPEPS - Set Ethernet Port Configuration
- IPEPP - Display Ethernet Port Configuration
- IPGWI - Internet Protocol Gateway Initiate
- IPGWE - Internet Protocol Gateway End
- IPGWP - Internet Protocol Gateway Print

6.7.1 IPEPS – Set Ethernet Port Configuration

Synopsis

This command is used to configure Ethernet ports.

The SGW supports resilient IP connectivity when the user configures a team of two ports in an active/ standby role. Three IP bonding teams can be created from the six ethernet ports available. A bonding team, assigned a single IP address, consists of a primary (active) port and a secondary (standby) port. The secondary port IP address should be set to one of the following values:

- STANDBY1 - The configured IP address acts as the standby port in a team with ETH1.
- STANDBY2 - The configured IP address acts as the standby port in a team with ETH2.
- STANDBY3 - The configured IP address acts as the standby port in a team with ETH3.
- STANDBY4 - The configured IP address acts as the standby port in a team with ETH4.
- STANDBY5 - The configured IP address acts as the standby port in a team with ETH5.
- STANDBY6 - The configured IP address acts as the standby port in a team with ETH6.

Syntax

```
IPEPS:ETH=, {[SPEED=,] [IPADDR=,][SUBNET=,] [SCTP=]};
```

Prerequisites

None.

Limitations

Up to 2 IP ports configured with an IP address may be associated with SCTP.

Attributes

CONFIG.

Examples

```
IPEPS:ETH=1,SPEED=100;

IPEPS:ETH=2,IPADDR=123.124.125.126,SCTP=Y;

IPEPS:ETH=3,IPADDR=100.1.1.10,SUBNET=255.255.1.1;

IPEPS:ETH=4,IPADDR=STANDBY2;
```

The SCTP parameter indicates that the port can be used for SCTP communication.

6.7.2 IPEPP – Display Ethernet Port Configuration

Synopsis

This command displays the Ethernet port configuration. An Ethernet port speed displayed with an H indicates it is half-duplex, otherwise it is full-duplex.

Syntax

```
IPEPP;
```

Prerequisites

None.

Attributes

None.

Examples

```
IPEPP;
```

Output Format

```
<ipepp;
ETH SPEED IPADDR          SUBNET          SCTP
1   AUTO  172.28.148.109  255.255.255.0   Y
2   AUTO  200.2.2.1       255.255.255.0   Y
3   AUTO  0.0.0.0         255.255.255.0   Y
4   AUTO  0.0.0.0         255.255.255.0   N
EXECUTED
```

6.7.3 IPGWI – Internet Protocol Gateway Initiate

Synopsis

This command allows the user to specify a route (IPGW) to a IP network (IPNW) via an IP gateway (GATEWAY) for a range of IP addresses within that network as defined by a network mask (MASK).

Syntax

```
IPGWI:IPGW=DEFAULT,GATEWAY=;
IPGWI:IPGW={1..31},MASK=,GATEWAY=,IPNW=;
```

Prerequisites

- The IP gateway ID has not been initiated.
- Two gateways cannot have overlapping IP addresses.

Attributes

CONFIG

Examples

```
IPGWI:IPGW=1,MASK=255.255.255.0,GATEWAY=194.192.185.1,
       IPNW=128.66.1.0;

IPGWI:IPGW=DEFAULT, GATEWAY=123.124.125.1;
```

6.7.4 IPGWE – Internet Protocol Gateway End

Synopsis

This command removes an IP route via an IP gateway.

Syntax

```
IPGWE:IPGW=;
```

Prerequisites

- The IP gateway ID has already been initiated.

Attributes

CONFIG

Examples

```
IPGWE:IPGW=1,;
```

6.7.5 IPGWP – Internet Protocol Gateway Print

Synopsis

This command prints out routes via IP gateways.

Syntax

```
IPGWP:[IPGW=];
```

Prerequisites

- If specified, the gateway ID should already have been initiated.

Attributes

None

Examples

```
IPGWP;
```

Output Format

```
IP Gateway Configuration
IPGW MASK             GATEWAY         IPNW
1    255.255.255.0    143.123.202.122 128.66.1.0
2    255.255.255.0    111.155.153.111 143.44.174.0
EXECUTED
```

6.8 MML Commands

The MML commands include:

- MMLOI - MML Log Off Initiate
- MMLOP - MML Log Off Print
- MMLOS - MML Log Off Set
- MMPTC - MML Port Change
- MMPTP - MML Port Print

6.8.1 MMLOI – MML Log Off Initiate

Synopsis

This command ends the current logon session and allows a new session to be used on the port. It does not affect other MML sessions.

Syntax

```
MMLOI;
```

Prerequisites

This command ends the current logon session and allows a new session to be used on the port. It does not affect other MML sessions.

Attributes

CONFIG

Examples

```
MMLOI;
```

6.8.2 MMLOP – MML Log Off Print

Synopsis

This command prints the current logon time-out parameters.

Syntax

```
MMLOP:[PORT=];
```

Prerequisites

None

Attributes

None

Examples

```
MMLOP;
MMLOP:PORT=1;
```

Output Format

```
Log on timeouts
PORT    TLO   TLOW
1       30    25
2       25    20
3       25    30
4       25    35
EXECUTED
```

6.8.3 MMLOS – MML Log Off Set

Synopsis

This command sets the current log-on time-out (TLO) and timeout warning (TLOW) parameters. If TLOW is set to zero, the automatic time-out is disabled. If port (PORT) is omitted, the command applies to all ports.

Syntax

```
MMLOS:{[TLO=,][TLOW=,]}[PORT=,];
```

Prerequisites

None

Attributes

CONFIG

Examples

```
MMLOS:TLO=35;
MMLOS:TLOW=19;
```

6.8.4 MMPTC – MML Port Change

Synopsis

This command sets the data input/output parameters for serial and telnet data ports.

Note: Only serial port 2 (COM2) is accessible by the user.

Syntax

```
MMPTC:PORT=,{[BAUD=,][DBITS=,][PARITY=,][SBITS=,][LINES=,][PTMODE=,]};
```

Prerequisites

- No user must be logged on to the port affected.
- For the telnet ports, only the LINES parameter can be changed.

Attributes

CONFIG

Examples

```
MMPTC:PORT=2,BAUD=300;
MMPTC:PORT=2,SBITS=2;
```

6.8.5 MMPTP – MML Port Print

Synopsis

This command gives a printout of the attributes of the serial port. Where the PORT parameter is omitted, the printout is provided for all ports. The connected port executing this command is marked with a “*”.

Note: Only serial port 2 (COM2) is accessible by the user.

Syntax

```
MMPTP[:PORT=];
```

Prerequisites

None

Attributes

None

Examples

```
MMPTP:PORT=1;
MMPTP;
```

Output Format

```
Serial Port Configuration
PORT    BAUD    DBITS   SBITS   PARITY  LINES   PTMODE   CONNECTED

1       9600    8       1       NONE    20      DTRDSR
2       1200    7       2       EVEN    8       NONE     *

3                                       25      TELNET

4                                       25      TELNET
EXECUTED
```

6.9 Maintenance Commands

The maintenance commands include:

- MNBLI - Maintenance Blocking Initiate
- MNBLE - Maintenance Blocking End
- MNINI - Maintenance Inhibit Initiate
- MNINE - Maintenance Inhibit End
- MNRSI - Maintenance Restart System Initiate

6.9.1 MNBLI – Maintenance Blocking Initiate

Synopsis

This command initiates blocking for boards, signaling links, remote data centers, SIGTRAN links and SIGTRAN Application Servers. A blocking command removes from use the board, link, route or server covered by the command, it also removes their configuration data from the lower levels of the Signaling Gateway and only configuration management maintains knowledge of their existence.

Possible grouping are:

- SS7 signaling links
- Boards
- Remote Data Centers (RDCs)
- SIGTRAN signaling links
- SIGTRAN Remote Application Servers

If the grouping being blocked is already in the blocked state, no action is taken.

If a C7 link has been inhibited, the inhibiting is removed as part of the blocking action.

Syntax

```
MNBLI:C7LINK=…;
MNBLI:BPOS=…;
MNBLI:RDC=…;
MNBLI:SNLINK=…;
MNBLI:RAS=…;
```

Prerequisites

- The item being blocked has been initiated.
- When blocking a board, all SS7 links on the board must already be blocked.
- If this is the last RDC to be blocked, then it cannot be blocked until all continuous records and periodic reports are ended.
- An SNLINK of SNTYPE M2PA can only be blocked if its associated C7LINK is either blocked or inhibited.

Attributes

```
CONFIG,PROMPT
```

Examples

```
MNBLI:SNLINK=12;
MNBLI:C7LINK=4;
```

Output Format

```
Blocking C7LINK 1
Blocking C7LINK 2
EXECUTED
```

6.9.2 MNBLE – Maintenance Blocking End

Synopsis

This command ends the blocked condition of boards, signaling links, remote data centers, SIGTRAN links and SIGTRAN Application Servers and brings them into service. The command restores configuration data to the lower levels of the Signaling Gateway and brings the timeslots into service. Possible groupings are:

- SS7 signaling links
- Boards
- Remote Data Centers (RDCs)
- SIGTRAN signaling links
- SIGTRAN Application Servers

Note: If an RDC has previously been blocked but a file transfer was already in progress, subsequent MNBLE commands which use that RDC fail with “NO SYSTEM RESOURCES” until the file transfer is complete.

Syntax

```
MNBLE:C7LINK=…;
MNBLE:BPOS=…;
MNBLE:RDC=…;
MNBLE:SNLINK=…;
MNBLE:RAS=…;
```

Prerequisites

- The item being unblocked has been initiated and is currently blocked.
- When unblocking an SS7 link with a signaling processor (EQU), both the board containing the signaling processor and the board containing the signaling timeslot must already be unblocked.
- An SS7 link with a signaling processor (EQU) cannot be unblocked until all the boards processing the SS7 signaling are blocked and then unblocked.
- An SS7 link cannot be unblocked if it is on a C7 route that has more than one link set and those link sets have either different OPCs, SS7MDs, NCs or NIs.
- An RAS cannot be unblocked unless it has a SNLINK attached.
- An M3UA SNLINK must have a default NC or a mapping of an NA into an NC.
- An M3UA SNLINK must have a mapping of an NA into an NC or a default NC matching the RAS NC the SNLINK is attached to.
- All the underlying SNLINKs of a RAS must have a mapping of an NA into an NC or a default NC matching the RAS NC.
- A C7LINK cannot be unblocked if an associated SNLINK is blocked.
- A network facing M2PA C7LINK can only be unblocked if the Signaling Gateway is licensed for M2PA operation.
- If the M3UASHARE parameter is blank only M3UA links or only M2PA links can be unblocked. If M3UASHARE has a value between 1-99 then all SIGTRAN links types can be unblocked.

Note: M2PA can be used for DUAL operation without a license.

Attributes

CONFIG

Examples

```
MNBLE:C7LINK=4;
```

Output Format

```
Unblocking C7LINK 1
EXECUTED
```

6.9.3 MNINI – Maintenance Inhibit Initiate

Synopsis

This command initiates the inhibiting of SS7 signaling. When specified without the INH parameter, the C7 signaling link is deactivated and no further signaling is allowed. When specified with INHIBIT =Y, the SS7 link inhibit message is sent over the signaling link. The command is also used to deactivate a hard disk drive prior to removal.

> ***Important:*** In order to maintain RAID array hard disk drive integrity, you should follow the correct procedure detailed in Section 7.7, “Hard Disk Management” on page 146.

Syntax

```
MNINI {[:C7LINK=,] [INHIBIT=,] [DRIVE=,]};
```

Prerequisites

- When specified without the INHIBIT parameter, the SS7 links have been initiated and are uninhibited.
- The disk drive must be active and not in the 'RESTARTING' state.

Attributes

CONFIG, PROMPT

Examples

```
MNINI:C7LINK=5;

MNINI:DRIVE=1;
```

Output Format

```
Inhibiting C7LINK 23
Inhibiting C7LINK 31
EXECUTED
```

6.9.4 MNINE – Maintenance Inhibit End

Synopsis

This command ends the inhibiting of C7 links. The C7 link is activated and signaling is allowed to proceed. When specified without the INHIBIT parameter, the C7 signaling link is activated and signaling is allowed to proceed. When specified with INHIBIT =N, the SS7 link uninhibit message is sent over the signaling link. The command is also used to activate a previously deactivated hard disk drive.

> ***Important:*** In order to maintain RAID array hard disk drive integrity, you should follow the correct procedure detailed in Section 7.7, “Hard Disk Management” on page 146.

Syntax

```
MNINE {[C7LINK=,] [INHIBIT=,] [DRIVE=,]};
```

Prerequisites

- When specified without the INHIBIT parameter, the SS7 links have been initiated and are inhibited.
- The disk drive must be in the ‘INACTIVE’ state.

Attributes

CONFIG

Examples

```
MNINE:C7LINK=5;

MNINE:DRIVE=1;
```

Output Format

```
Uninhibiting C7LINK 23
Uninhibiting C7LINK 31
EXECUTED
```

6.9.5 MNRSI – Maintenance Restart System Initiate

Synopsis

This command restarts the entire system. All current logon sessions are terminated.

If a software update disk is present on a CD or USB, then the software update procedure commences.

If no software update disk is present, but a CD or USB containing a configuration dump is present, this configuration is loaded into memory and the system restarts.

In all other cases, no change to the system configuration occurs and the state of all links is automatically restored.

If RESET is set to Y, all configuration data is removed.

If SYSTYPE is set, the systems operating mode changes after restart. Possible operation modes are:

- DSC – Digital Signaling Conveter
- SGW – SIGTRAN Signaling Gateway
- SIU – Signaling Interface Unit

Syntax

```
MNRSI:[RESTART=,][RESET=Y,][SYSTYPE=,];
```

Prerequisites

- SYSTYPE can only be set to system types that have been licensed for the unit. See the CNSYP command.

Attributes

PROMPT

Examples

```
MNRSI;
MNRSI:RESET=Y;
MNRSI:SYSTYPE=SGW;
MNRSI:RESTART=SOFT;
```

6.10 Measurement Commands

The measurement commands include:

- MSC7P - Measurements SS7 Print
- MSEPP - Measurement Ethernet Port Print
- MSLCP - Measurement of License Capability Print
- MSPCP - Measurements PCM Print
- MSSLP - Measurements SIGTRAN Link Print
- MSSYP - Measurements System Print

6.10.1 MSC7P – Measurements SS7 Print

Synopsis

This command prints traffic measurements for SS7 signaling links. The measurements are cumulative between system startup and the next time the measurements are reset.

The fields have the following meanings:

- C7LINK - SS7 signaling Link.
- OOSDUR - Duration that the link was not in service. This field is not currently supported.
- RXNACK - Number of negative acknowledgements received.

  Note: RXNACK is not applicable for M2PA SS7 links and is set to 0. See the MSSLP command description for SNLINK measurements.
- RXMSU - Number of message signaling units octets received.
- RXOCT - Number of SIF and SIO octets received.
- TXMSU - Number of message signaling units octets transmitted.
- TXOCT - Number of SIF and SIO octets transmitted.
- RTXOCT - Octets retransmitted.

  Note: RTXOCT is not applicable for M2PA SS7 links and is set to 0. See the MSSLP command description for SNLINK measurements.
- NCONG - Congestion counter.
- PERIOD - Time since measurements on the route were last reset. Specified in hours, minutes and seconds.
- ALIGN - Number of failed signaling link alignment attempts
- SUERR - Number of signal units in error
- TBUSY - Duration of local busy condition
- TCONG - Duration of link congestion
- NDISCARD - Number of MSUs discarded due to congestion
- NEVENT - Number of congestion events leading to MSU discard

Syntax

```
MSC7P:[PAGE=,][C7LINK=,][RESET=,];
```

Prerequisites

- If specified, the SS7 signaling link must be initiated and unblocked.

Attributes

None

Examples

```
MSC7P:C7LINK=1;
MSC7P;
```

Output Format

```
SS7 Link Traffic Measurements (Page 1 of 2)
C7LINK OSSDUR RXNACK RXMSU  RXOCT  TXMSU    TXOCT  RTXOCT NCONG  PERIOD
1      0      0      188    4136   188      4136   0      0      00:46:39
2      0      0      188    4136   188      4136   0      0      00:46:39
3      0      0      0      0      0        0      0      0      00:46:39
EXECUTED

SS7 Link Traffic Measurements (Page 2 of 2)
C7LINK ALIGN  SUERR  TBUSY  TCONG  NDISCARD NEVENT PERIOD
1      0      0      0      0      0        0      00:46:39
2      0      0      0      0      0        0      00:46:39
3      92     0      0      0      0        0      00:46:39
EXECUTED
```

6.10.2 MSEPP – Measurement Ethernet Port Print

Synopsis

This command prints the traffic measurements for each Ethernet port on the system taken over a period of time. The meaning of each field in the output is as follows:

The meaning of each field in the output is as follows:

- ETH - Ethernet port number.
- RXKBTYE - Number of kilobytes of data received (in kilobytes)
- RXPKT - Number of packets of data received
- RXERR - Number of receive errors detected
- RXDROP - Number of received packets dropped by the device driver during the measurement period
- TXKBTYE - Number of kilobytes of data transmitted (in kilobytes)
- TXPKT - Number of packets of data transmitted
- TXERR - Number of transmit errors detected
- TXDROP - Number of transmit packets
- PERIOD - The period over which the measurement was taken
- RXFIFO - The number of FIFO buffer errors received
- RXFRAME - The number of packet framing errors received
- RXCOMP - The number of compressed packets received
- RXMULT - The number of multicast frames received
- TXFIFO - The number of FIFO buffer error transmitted
- TXCOLLS - The number of collisions detected on the transmit side
- TXCARRIER - The number of carrier losses detected on the transmit side
- TXCOMP - The number of compressed packets transmitted

Note: Values are reset using the RESET parameter. MSEPP:RESET=Y; resets the measurement values to 0.

Syntax

```
MSEPP:[RESET=,][PAGE=,];
```

Prerequisites

None.

Attributes

None.

Examples

```
MSEPP:RESET=YES,PAGE=2;
MSEPP;
```

Output Format

```
Ethernet Port Measurements (Page 1 of 2)
ETH RXKBYTE RXPKT  RXERR  RXDROP TXKBYTE TXPKT  TXERR  TXDROP PERIOD
1   0       0      0      0      0       0      0      0      16:34:41
2   96324   135705 0      4204E5 28169   4444   0      0      16:34:41
3   0       0      0      0      0       0      0      0      16:34:41
4   3760    3273   0      33615  12503   3455   0      0      16:34:41
EXECUTED

Ethernet Port Measurements (Page 2 of 2)
ETH RXFIFO RXFRAME RXCOMP RXMULT TXFIFO TXCOLLS TXCARRIER TXCOMP PERIOD
1   0      0       0      0      0      0       0          0      16:34:41
2   0      0       0      0      0      0       0          0      16:34:41
3   0      0       0      0      0      0       0          0      16:34:41
4   0      0       0      0      0      0       0          0      16:34:41
EXECUTED
```

6.10.3 MSLCP – Measurement of License Capability Print

Synopsis

This command prints the traffic measurements for each license on the system capable of supporting throughput licensing.

The meaning of each field in the output is as follows:

- **CAPABILITY** - A licensable capability of the system. This may be a protocol license or an operating mode license. A capability may have been purchased as a software license, shipped as part of the system or bundled as part of another license. If a capability is either not active on the system or doesn't provide measurements then it will not be displayed.
- **RXDATA** - The amount of data received in Kilobytes during the measurement period.
- **TXDATA** - The amount of data transmitted in Kilobytes during the measurement period.
- **RXPEAK** - The peak received data rate in Kilobytes/s averaged over a rolling thirty second time window.
- **TXPEAK** - The peak transmit data rate in Kilobytes/s averaged over a rolling thirty second time window.
- **PEAK** - The peak data rate for both transmitted and received data in Kilobytes/s averaged over a rolling thirty second time window
- **CONGESTION** - The number of times the license has exceeded its throughput threshold.
- **ENFORCEMENT** - The number of times the unit has enforced the license throughput limit.
- **PERIOD** - Time since measurements on the route were last reset. Specified in hours, minutes and seconds.

Note: Values are reset using the RESET parameter. MSEPP:RESET=Y; resets the measurement values to 0.

Syntax

```
MSLCP:[RESET=,];
```

Prerequisites

None.

Attributes

None.

Examples

```
MSLCP;
MSLCP:RESET=Y;
Output Format
Software License Capability Traffic Measurements
CAPABILITY RXDATA TXDATA RXPEAK TXPEAK PEAK CONG  ENFORCE PERIOD
M3UA       4204E5 3212E4 154    456     923 1     1       01:33:33
EXECUTED
```

6.10.4 MSPCP – Measurements PCM Print

Synopsis

This command prints traffic measurements for PCMs. The measurements are cumulative between system startup and the next time the measurements are reset.

The fields have the following meanings:

- PCM - PCM on a board
- FMSLIP - Frame Slip count
- OUTSYN - Out-sync transitions
- ERRSEC - Errored Seconds count
- SEVSEC - Severely Errored seconds count
- PERIOD - Time since measurements on the route were last reset. Specified in hours, minutes and seconds

Syntax

```
MSC7P:[C7LINK=,][RESET=,];
```

Prerequisites

- If specified, the PCM must be initiated and on an unblocked board.

Attributes

None

Examples

```
MSPCP:PCM=5-1;
MSPCP;
```

Output Format

```
PCM Traffic Measurements
PCM    FMSLIP OUTSYN ERRSEC SEVSEC PERIOD
3-3    57     60     23     1      23:00:00
3-4    12     35     33     4      01:00:00
4-4    53     55     4      0      01:00:00
EXECUTED
```

6.10.5 MSSLP – Measurements SIGTRAN Link Print

Synopsis

This command prints traffic measurements for SIGTRAN signaling links. The measurements are cumulative between system startup and the next time the measurements are reset.

The fields have the following meanings:

- SNLINK - SIGTRAN signaling link
- RXCK - Number of data chunks received
- TXCK - Number of data chunks transmitted
- RTXCK - Number of data chunks re-transmitted
- NOOS - Number of times a SIGTRAN link has either been aborted or shutdown
- OSDUR - Duration that the link was not in service
- PERIOD - Time since measurements on the route were last reset. Specified in hours, minutes and seconds

Syntax

```
MSSLP:[SNLINK =,][RESET=,];
```

Prerequisites

- If specified, the SIGTRAN signaling link must be an initiated and unblocked.

Attributes

None

Examples

```
MSSLP:SNLINK=1;
MSSLP;
```

Output Format

```
SIGTRAN Link Traffic Measurements
SNLINK RXCK TXCK  RTXCK  OSDUR  NOOS PERIOD
1      54   6330  23     0      0    05:00:00
2      21   12    345    0      0    05:00:00
3      12   53    500    0      0    05:00:00
EXECUTED
```

6.10.6 MSSYP – Measurements System Print

Synopsis

This command prints out system related measurements for load and congestion taken over a period of time. The fields in the output have the following meanings:

- NOVLD - The number of periods of congestion (overload) during the measurement period.
- MAXLOAD - Maximum load average measurement taken over one minute (based on the UNIX load average).
- LOADAVG - The average load on the system (based on the UNIX load average) measurement taken over the measurement period.
- PERIOD - The period the measurement was taken over.

Note: Values are reset using the RESET parameter. MSSYP:RESET=Y; resets the measurement values to 0.

Syntax

```
MSSYP:[RESET=,];
```

Prerequisites

None

Attributes

None

Examples

```
MSSYP;
```

Output Format

```
System Measurements
NOVLD        0
MAXLOAD      28.81%
LOADAVG      2.28%
PERIOD       18:36:55
EXECUTED
```

6.11 Remote Data Center Commands

The Remote Data Center (RDC) commands include:

- RDCRI - Remote Data Center Continuous Record Initiate
- RDCRC - Remote Data Center Continuous Record Change
- RDCRE - Remote Data Center Continuous Record End
- RDCRP - Remote Data Center Continuous Record Print
- RDPDI - Remote Data Center Periodic Data Initiate
- RDPDE - Remote Data Center Periodic Data End
- RDPDP - Remote Data Center Periodic Data Print
- RDPRI - Remote Data Center Periodic Report Initiate
- RDPRC - Remote Data Center Periodic Report Change
- RDPRE - Remote Data Center Periodic Report End
- RDPRP - Remote Data Center Periodic Report Print

6.11.1 RDCRI – Remote Data Center Continuous Record Initiate

Synopsis

This command initiates a continuous record collection for which collected data is transferred via Ethernet to a Remote Data Center (RDC).

The period is the maximum amount of time allowed before the transfer of a block of continuous records must be performed.

The minimum number of records that must be collected before the transfer of records can be performed should be specified.

The label is used as the directory name on the Remote Data Center (RDC) that the files are written to.

Syntax

```
RDCRI:RECORD=,CRTYPE=,PERIOD=,MINREC=,RDC1=,LABEL=,[RDC2=,];
```

Prerequisites

- The record has not already been initiated.
- The Signaling Gateway must have an IPADDR.
- If the record is an alarm record, an alarm record must not already exist.
- RDC1 must already be initiated.
- If specified, RDC2 must already be initiated.
- If specified, RDC2 must not equal RDC1.

Limitations

- Before transfer to a RDC can take place, the directory (represented by the label) must exist on the remote site.
- PERIOD must be in the range 30 seconds to 30 minutes.

Attributes

CONFIG

Examples

```
RDCRI:RECORD=1,CRTYPE=ALARM,PERIOD=00:05:00,MINREC=100,
RDC1=1,LABEL=ALARM;
```

6.11.2 RDCRC – Remote Data Center Continuous Record Change

Synopsis

This command changes the parameters for a continuous record collection for which collected data is transferred via Ethernet to a Remote Data Center (RDC).

The period is the maximum amount of time allowed before the transfer of a block of continuous records must be performed.

The label is used as the directory name on the RDC that the files are written to.

Syntax

```
RDCRC:RECORD=,[PERIOD=,][MINREC=,][RDC1=,][RDC2=,][LABEL=];
```

Prerequisites

- The record must already be initiated.
- If specified, RDC1 must already be initiated.
- If specified, RDC2 must already be initiated
- If specified, RDC2 must not equal RDC1.

Limitations

- Before transfer to a RDC can take place, the directory (represented by the label) must exist on the remote site.
- PERIOD must be in the range 30 seconds to 30 minutes.

Attributes

CONFIG

Examples

```
RDCRC:RECORD=1,PERIOD=00:05:00,MINREC=100,
RDC1=1,LABEL=ALARM;
```

6.11.3 RDCRE – Remote Data Center Continuous Record End

Synopsis

This command ends a continuous record.

If DISCARD is set to Y, any data associated with the continuous record is discarded. If DISCARD is not set to Y, and if there is data awaiting transfer, the end continuous record is rejected.

Syntax

```
RDCRE:RECORD=,[DISCARD=Y];
```

Prerequisites

- The report has already been initiated.
- There is no continuous data associated with the continuous record.

Attributes

CONFIG

Examples

```
RDCRE:RECORD=1;
```

6.11.4 RDCRP – Remote Data Center Continuous Record Print

Synopsis

This command prints data relating to a continuous record for which collected data is transferred to a Remote Data Center (RDC).

Syntax

```
RDCRP;
```

Prerequisites

None

Attributes

CONFIG

Examples

```
RDCRP;
```

Output Format

```
Remote Data Centre Continuous Record
RECORD CRTYPE     PERIOD     MINREC  RDC1 RDC2 LABEL
1      ALARM      00:05:00   100     2    1    ALARM
EXECUTED
```

6.11.5 RDPDI – Remote Data Center Periodic Data Initiate

Synopsis

This command attaches an SS7 link (C7LINK), SIGTRAN link (SNLINK) or PCM (PCM) to a periodic report.

Syntax

```
RDPDI:REPORT=,[C7LINK=|SNLINK=|PCM=];
```

Prerequisites

- The report has already been initiated.
- The specified SS7 link has already been initiated.
- SS7 links can only be specified for MSC7 reports.
- An association between the report and the SS7 link has not already been initiated.

Attributes

CONFIG

Examples

```
RDPDI:REPORT=1,C7LINK=1&&8;
```

6.11.6 RDPDE – Remote Data Center Periodic Data End

Synopsis

This command ends the attachment between an outgoing route and a report.

Syntax

```
RDPDE:REPORT=,[C7LINK= | SNLINK=| PCM=];
```

Prerequisites

- The report has already been initiated.
- An association between the report and the SS7 link has already been initiated.

Attributes

CONFIG

Examples

```
RDPDE:REPORT=1,C7LINK=1;
```

6.11.7 RDPDP – Remote Data Center Periodic Data Print

Synopsis

This command prints the outgoing routes associated with a periodic data collection report.

The command prints a list of report elements depending on the type of the report.

Syntax

```
RDPDP:REPORT=;
```

Prerequisites

- The periodic report has been initiated.

Attributes

CONFIG

Examples

```
RDPDP:REPORT=1;
```

Output Format

```
Remote Data Centre Periodic Data
REPORT C7LINK
1      1
1      2
1      3
1      5
1      8
EXECUTED
```

6.11.8 RDPRI – Remote Data Center Periodic Report Initiate

Synopsis

This command initiates a report collection period for which data is collected and transferred over Ethernet to a Remote Data Center (RDC).

Reports for outgoing route traffic measurements can be specified.

The label is used as the directory name on the RDC that the files are written to.

The period is the interval between which data is collected. It is rounded to the nearest 5-minute interval.

Data can be added or deleted from the periodic report using the RDPDI or RDPDE commands.

Syntax

```
RDPRI:REPORT=,PRTYPE=,PERIOD=,LABEL=,RDC1=,[RESET=,][RDC2=,];
```

Prerequisites

- The report has not already been initiated.
- If specified, RDC2 cannot have the same value as RDC1.
- RDC1 must already have been initiated.
- If specified, RDC2 must already be initiated.

Limitations

Before transfer to an RDC can take place, the directory (represented by the label) must exist on the remote site.

Attributes

CONFIG

Examples

```
RDPRI:REPORT=1,PRTYPE=MSC7,PERIOD=01:00:00,RDC1=1,LABEL=SS7;
```

6.11.9 RDPRC – Remote Data Center Periodic Report Change

Synopsis

This command changes parameters relating to a report collection period for which data is collected and transferred over Ethernet to a Remote Data Center (RDC).

Reports for outgoing route traffic measurements can be specified.

The label is used as the directory name on the RDC that the files are written to.

The period is the interval between which data is collected. It is rounded to the nearest 5 minute interval.

Data can be added or deleted from the periodic report using the RDPDI or RDPDE commands.

Syntax

```
RDPRC:REPORT=,[PERIOD=,][LABEL=,][RDC1=,][RDC2=,][RESET=,];
```

Prerequisites

- The report must already be initiated.
- If specified, RDC2 cannot have the same value as RDC1.
- If specified, RDC1 must already be initiated.
- If specified, RDC2 must already be initiated.

Limitations

Before transfer to an RDC can take place, the directory (represented by the label) must exist on the remote site.

Attributes

CONFIG

Examples

```
RDPRC:REPORT=1,PERIOD=01:00:00,RDC1=1,LABEL=SS7;
```

6.11.10 RDPRE – Remote Data Center Periodic Report End

Synopsis

This command ends a periodic report.

Syntax

```
RDPRE:REPORT=;
```

Prerequisites

- The report has already been initiated.
- There is no periodic data associated with the periodic report.

Attributes

CONFIG

Examples

```
RDPRE:REPORT=1;
```

6.11.11 RDPRP – Remote Data Center Periodic Report Print

Synopsis

This command prints data relating to a periodic report collection period for which collected data is transferred to a Remote Data Center (RDC).

Syntax

```
RDPRP;
```

Prerequisites

None

Attributes

CONFIG

Examples

```
RDPRP;
```

Output Format

```
Remote Data Centre Periodic Report Configuration
REPORT PRTYPE PERIOD   RESET RDC1 RDC2 LABEL
1      MSC7   01:00:00 Y     1    2    SS7
EXECUTED
```

6.12 Signaling Gateway Commands

The Signaling Gateway commands include:

- SGDPI - Signaling Gateway Destination Point Initiate
- SGDPC - Signaling Gateway Destination Point Change
- SGDPE - Signaling Gateway Destination Point End
- SGDPP - Signaling Gateway Destination Point Print
- SGIRI - Signaling Gateway Incoming Route Initiate
- SGIRC - Signaling Gateway Incoming Route Change
- SGIRE - Signaling Gateway Incoming Route End
- SGIRP - Signaling Gateway Incoming Route Print
- SGRKI - Signaling Gateway Routing Key Initiate
- SGRKE - Signaling Gateway Routing Key End
- SGRKP - Signaling Gateway Routing Key Print

6.12.1 SGDPI – Signaling Gateway Destination Point Initiate

Synopsis

This command initiates routing to a destination point identified by a routing key or incoming route. Destination selection either selects an Remote Application Server (RAS) or attempts to route to the MTP or IP side on a priority basis. If an Application Server is not configured, the Signaling Gateway attempts to find a route to the Destination Point Code (DPC) of the received message over MTP or IP. The user can configure whether to route the message via MTP or IP if the Point Code is available over both by setting the RTPRI parameter.

A destination can either be a route (MTP or IP or a combination of both) or a Application Server. If both MTP and IP routes are specified, the default priority indicates which route to the Point Code should be selected first if available. MTPONLY and IPONLY state that no attempt to other domain should be made if the routes through these domains are unavailable.

Syntax

```
SGDPI:DEST=,RTPRI=,[LABEL=,];
SGDPI:DEST=,RAS=,[LABEL=,];
```

Prerequisites

- The destination point has not already been initiated.
- An RAS, if specified, must serve only 1 destination.
- If an RAS is specified, it must be initialized.
- RTPRI cannot be set to NONE if an RAS is not present.
- NONE is the only value allowed for RTPRI if an RAS is present.

Attributes

CONFIG

Examples

```
SGDPI:DEST=1, RAS=1;
```

6.12.2 SGDPC – Signaling Gateway Destination Point Change

Synopsis

This command changes parameters on the Signaling Gateway destination point.

Syntax

```
SGDPC:DEST=,[RTPRI=,][RAS=,][LABEL=,];
```

Prerequisites

- The destination point has already been initiated.
- If an RAS is specified, it must serve only one destination.
- If an RAS is specified, it must be initialized.
- RTPRI cannot be set to NONE if an RAS is not present.
- NONE is the only value allowed for RTPRI if RAS is present.
- If an RAS is specified, there cannot be any routing key in the system with a destination to this RAS, not having or not matching the NC/DPC parameters with the RAS NC/DPC.

Attributes

CONFIG

Examples

```
SGDPC:DEST=1, RAS=1;
```

6.12.3 SGDPE – Signaling Gateway Destination Point End

Synopsis

This command ends a Signaling Gateway destination point.

Syntax

```
SGDPE:DEST=;
```

Prerequisites

- The destination ID has already been initiated.
- The destination ID is not used elsewhere in the system.

Attributes

CONFIG

Examples

```
SGDPE:DEST=1;
```

6.12.4 SGDPP – Signaling Gateway Destination Point Print

Synopsis

This command prints the configuration of routing parameters on a SS7 Signaling Gateway.

Syntax

```
SGDPP:[DEST=];
```

Prerequisites

- The destination ID has already been initiated.

Attributes

None

Examples

```
SGDPP;
```

Output Format

```
SS7 Routing Key Configuration
DEST RTPRI    RAS LABEL
1    NONE     1   AS1
2    IP           SGW2
3    MTP          DEST3
EXECUTED
```

6.12.5 SGIRI – Signaling Gateway Incoming Route Initiate

Synopsis

This command initiates an incoming route on a Signaling Gateway. The incoming route is selected by the network and domain (TDM or SIGTRAN) that a data message came from. The network is specified on an SS7 link set on the TDM side and a SIGTRAN link on the SIGTRAN side.

An incoming route can either go directly to a destination or perform analysis of the received message to determine a destination. If analysis fails, or the destination determined by analysis is not available, the incoming route can use the destination associated with it as a default destination.

For RKTAB, DEST, NC, and DOMAIN, a value of “null” is supported. “null” indicates a wildcard value and means any value. “null” is the default value for an RKTAB/DEST entry.

Note: The value “null” cannot be used for these parameters elsewhere in the system unless explicitly specified in the command.

Syntax

```
SGIRI:IR=,[NC=,][DOMAIN=,]{[RKTAB=,][DEST=,]}[LABEL=,];
```

Prerequisites

- If specified, the destination index exists.
- Either an RKTAB or DEST must exist.
- The incoming route does not already exist.
- The NC/DOMAIN combination has not already been specified nor does it form a superset or subset of an existing NC/DOMAIN combination

Note: This check takes into account one or more routing elements marked as a wild card.

Attributes

CONFIG

Examples

```
SGIRI:IR=1, DOMAIN=IP,RKI=1;
```

6.12.6 SGIRC – Signaling Gateway Incoming Route Change

Synopsis

This command changes the configuration of a Signaling Gateway incoming route.

For RKTAB/DEST, a value of “null” is supported. “null” indicates a wildcard value and means any value. “null” is the default value for an RKTAB/DEST entry.

Note: The value “null” cannot be used for these parameters elsewhere in the system unless explicitly specified in the command.

Syntax

```
SGOPC:IR=,[RKTAB=,][DEST=,][LABEL=];
```

Prerequisites

- The incoming route already exists.
- If specified, the destination index exists.
- The NC/DOMAIN combination has already been initiated.
- Either an RKTAB or DEST must exist.

Attributes

CONFIG

Examples

```
SGIRC:IR=1,DEST=5;
```

6.12.7 SGIRE – Signaling Gateway Incoming Route End

Synopsis

This command ends the configuration of a Signaling Gateway incoming route.

Syntax

```
SGIRE:IR=;
```

Prerequisites

- The incoming route already exists.

Attributes

CONFIG

Examples

```
SGIRE:IR=1;
```

6.12.8 SGIRP – Signaling Gateway Incoming Route Print

Synopsis

This command prints the configuration of a Signaling Gateway incoming route.

Syntax

```
SGIRP:[IR=];
```

Prerequisites

- If specified, the IR has already been initiated.

Attributes

None

Examples

```
SGIRP;
```

Output Format

```
Signaling Gateway Incoming Route Configuration
IR NC DOMAIN   RKTAB DEST LABEL
1  1  TDM      1          ORIG1
2  1  SIGTRAN  1          ORIG1
3  2          2          ORIG2
4  3  TDM      3          ORIG3
EXECUTED
```

6.12.9 SGRKI – Signaling Gateway Routing Key Initiate

Synopsis

This command initiates a routing key or partial routing key to determine a destination identifier. The destination identifier is then used to select the outgoing destination. The Signaling Gateway compares the routing keys with a data message in an attempt to find a data match. If a match is found, the destination identifier is then used to select a route to an eventual destination.

The user can define a number of different tables of routing keys. In the routing model, the incoming route identifies which routing table to use.

Apart from the routing key index and routing key table, the routing key elements are optional and can be wildcarded with a null string.

A routing key is defined as a combination of NC//NI/SI/OPC/DPC/BCIC/RANGE.

For DPC, OPC, NI, SI, NC, BCIC and RANGE, a value of “null” is supported. “null” indicates a wildcard value and means any value. “null” is the default value for a routing key entry.

> ***Note:*** The value “null” cannot be used for these parameters elsewhere in the system unless explicitly specified in the command.

Syntax

```
SGRKI:RKI=,RKTAB=,[NC=,][OPC=,][NI=,][SI=,][DPC=,][RANGE=,BCIC=,]DEST=;
```

Prerequisites

- The routing key ID has not already been specified.
- The routing key combination has not already been specified nor does it form a superset or subset of an existing routing key.

  > ***Note:*** This check takes into account one or more routing elements marked as a wild card.
- The destination ID has already been initiated.
- If SI is set to SCCP, the BCIC/RANGE parameters cannot be specified.
- If one of BCIC/RANGE are specified, the other must be specified.
- For circuit related keys, the CIC ranges specified for an NC/OPC/NI/DPC combination must not overlap existing ranges for that combination.
- If an OPC or DPC are specified, the NC cannot be wildcarded.
- BCIC cannot be negative.
- If the routing key has a destination to an RAS, the NC/DPC parameters are required and must match with the RAS NC/DPC.

Attributes

CONFIG

Examples

```
SGRKI:RKI=1,RKTAB=,NC=1,OPC=55,DPC=33,DEST=1;
```

6.12.10 SGRKE – Signaling Gateway Routing Key End

Synopsis

This end configuration of a routing key or a particular subset of routing keys.

Syntax

```
SGRK:RKI=;
```

Prerequisites

- The routing key combination has already been specified.

Attributes

CONFIG

Examples

```
SGRKE:RKI=1,NC=1,OPC=55,DPC=33;
```

6.12.11 SGRKP – Signaling Gateway Routing Key Print

Synopsis

This command prints the configuration of Routing Keys.

Syntax

```
SGRKP:[RKI=,][RKTAB=,][DEST=,];
```

Prerequisites

None

Attributes

CONFIG

Examples

```
SGRKP;
```

Output Format

```
Routing Key Analysis configuration
RKI  RKTAB NC NI SI OPC      DPC      BCIC RANGE DEST
1    1     1  2     2        194      0    32    2
2    1     2  2     2        133                 3
3    1     3  2              1332                43

EXECUTED
```

6.13 SIGTRAN Commands

The SIGTRAN commands include:

- SNALI - SIGTRAN Application Server List Initiate
- SNALE - SIGTRAN Application Server List End
- SNALP - SIGTRAN Application Server List Print
- SNRAI - SIGTRAN Remote Application Server Initiate
- SNRAE - SIGTRAN Remote Application Server End
- SNRAP - SIGTRAN Remote Application Server Print
- SNNAI - SIGTRAN Network Appearance Initiate
- SNNAE - SIGTRAN Network Appearance End
- SNNAP - SIGTRAN Network Appearance Print
- SNSLI - SIGTRAN Signaling Link Initiate
- SNSLC - SIGTRAN Signaling Link Change
- SNSLE - SIGTRAN Signaling Link End
- SNSLP - SIGTRAN Signaling Link Print

6.13.1 SNALI – SIGTRAN Application Server List Initiate

Synopsis

This command attaches a list of SIGTRAN links to a Remote Application Server (RAS). The SIGTRAN links provide the SCTP associations to reach the RAS.

See Section 7.2, “Signaling Configuration” on page 137 for a more detailed description of SIGTRAN signaling configuration.

Syntax

```
SNALI:RAS=,SEQ=,SNLINK=;
```

Prerequisites

- The RAS has already been initiated.
- The specified SIGTRAN link has already been initiated.
- A SIGTRAN link cannot be specified in more than one hunt sequence position for this server.
- The server/hunt sequence combination must not already be initiated.
- The SIGTRAN links attached to the server must be M3UA and their peers be able to process RASs (that is, not act as Signaling Gateways).
- A SNLINK cannot be attached to more than 32 RASs.
- The SNTYPE of the SNLINK cannot be M2PA.

Attributes

CONFIG

Examples

```
SNALI:RAS=1,SEQ=1,SNLINK=1;
```

6.13.2 SNALE – SIGTRAN Application Server List End

Synopsis

This command ends a relationship between an Remote Application Server (RAS) and a SIGTRAN link.

Syntax

```
SNALE:RAS=,SEQ=;
```

Prerequisites

- The RAS sequence combination has already be initiated.
- The last entry in a list of SIGTRAN links attached to a RAS cannot be removed unless the RAS is blocked.

Attributes

CONFIG

Examples

```
SNALE:RAS=,SEQ=;
```

6.13.3 SNALP – SIGTRAN Application Server List Print

Synopsis

This command reports the relationship between a SIGTRAN Remote Application Server (RAS) and SIGTRAN links.

Syntax

```
SNALP;
SNALP:RAS=;
SNALP:SNLINK=;
```

Prerequisites

- The server/hunt sequence combination has already be initiated.

Attributes

None

Examples

```
SNALP;
```

Output Format

```
Application Server List Configuration
RAS     RAS LABEL SEQ  SNLINK SNLINK LABEL
1       AS1       1    1      ASP1
1       AS1       2    2      ASP2
2       AS2       1    3      ASP3
EXECUTED
```

6.13.4 SNRAI – SIGTRAN Remote Application Server Initiate

Synopsis

This command initiates an adjacent Remote Application Server (RAS). A RAS is a logical entity representing an SS7 end point that can process either circuit-related or non circuit-related signaling. The end point is represented by a routing context which uniquely identifies a routing key combination of SIO/DPC/OPC and CIC range.

See Section 7.2, “Signaling Configuration” on page 137 for a more detailed description of SIGTRAN signaling configuration.

Syntax

```
SNRAI:RAS=,DPC=,RC=,NC=,[PCMD=,][NASP=,][LABEL=,];
```

Prerequisites

- The RAS has not already been initiated.
- No other RAS can use the routing context.
- No more than 32 RASs can be configured with the same DPC/NC combination.
- All RASs within the same DPC/NC combination must have the same PCMD value.

Attributes

CONFIG

Examples

```
SNRAI:RAS=1,DPC=555,RC=1,NC=1;
```

6.13.5 SNRAE – SIGTRAN Remote Application Server End

Synopsis

This command ends a Remote Application Server (RAS).

Syntax

```
SNRAE:RAS=;
```

Prerequisites

- The server has already be initiated.
- There are no SIGTRAN links attached to the server.
- The server is not part of a destination.
- The server must be blocked.

Attributes

CONFIG

Examples

```
SNRAE:RAS=1;
```

6.13.6 SNRAP – SIGTRAN Remote Application Server Print

Synopsis

This command prints information relating to a SIGTRAN Remote Application Server (RAS).

Syntax

```
SNRAP:[RAS=];
```

Prerequisites

- If specified, the RAS has already be initiated.

Attributes

None

Examples

```
SNRAP;
```

Output Format

```
SIGTRAN Application Server Configuration
RAS   DPC       NC   RC          PCMD NASP   LABEL
1     55        1    5           ANY  0      AS1
2     44        2    44          ANY  2      AS2
EXECUTED
```

6.13.7 SNNAI – SIGTRAN Network Appearance Initiate

Synopsis

This command initiates a relationship between a Network Context and a Network Appearance on a per SIGTRAN link basis.

See Section 7.2, “Signaling Configuration” on page 137 for a more detailed description of SIGTRAN signaling configuration.

Syntax

```
SNNAI:NC=,SNLINK=,SS7MD=,NA=;
```

Prerequisites

- The SNLINK has been already initiated.
- The SS7MD associated with the NC cannot be different to a SS7MD associated with a NC anywhere else in the system.
- There is a one-to-one relation between NC and NA on a SNLINK.
- The NC cannot be the default value for this SNLINK.
- The SNTYPE of the SNLINK cannot be M2PA.

Attributes

CONFIG

Examples

```
SNNAI:NC=1,SNLINK=1,SS7MD=ITU14,NA=63;
```

6.13.8 SNNAE – SIGTRAN Network Appearance End

Synopsis

This command ends a relationship between an NC and NA on a per SNLINK basis.

Syntax

```
SNNAE:SNLINK=,NC=;
```

Prerequisites

- The NC has already been initiated.
- The SNLINK has already been initiated.
- There is a configured relationship between NC and NA in this SNLINK.
- There are no unblocked RASs using this SNLINK and NC combination.
- If the SNLINK is unblocked, there are NA mapping in other Network Contexts for the SNLINK.

Attributes

CONFIG

Examples

```
SNNAE:SNLINK=1,NC=1;
```

6.13.9 SNNAP – SIGTRAN Network Appearance Print

Synopsis

This command gives a printout of the relationship between Network Contexts (NCs) and Network Appearances (NAs) on a per SNLINK basis.

Syntax

```
SNNAP:[NC=,][SNLINK=,];
```

Prerequisites

- If specified, the NC or SNLINK has already be initiated.

Attributes

None

Examples

```
SNNAP;
```

Output Format

```
SIGTRAN Network Appearances
NC   SNLINK   SS7MD NA
1    1        ITU14 63
2    2        ITU14 64
EXECUTED
```

6.13.10 SNSLI – SIGTRAN Signaling Link Initiate

Synopsis

This command initiates a SIGTRAN link. A SIGTRAN link (SNLINK) provides an SCTP association to an adjacent Application Server Process or Signaling Gateway specified by one (IPADDR) or two (IPADDR2) IP addresses as well as the host (HPORT) and peer (PPORT) SCTP port. The user should specify the type of SIGTYPE link (SNTYPE) and which IP end (END) the Signaling Gateway is acting as.

For M2PA, the SIGTRAN link is associated with a SS7 link by the C7SLI command.

For M3UA, a default SS7 mode (SS7MD) and network context (NC) can be specified. This allows the user to designate an SS7 format and mode of operation to a link. If the user requires the SNLINK to exist in multiple networks, the user should not specify a default network context nor an SS7 mode, instead they should associate it with a Network Appearance using the SNNAI command prior to unblocking.

If two IP addresses are specified, the first IP address is used until it proves unreliable, in which case the second IP address is used.

When SECURE is set to Y, the SIGTRAN link does not come into service on unblocking if it receives messaging from a peer that has an IP address not associated with the SIGTRAN link.

> ***Note:*** Normal operation for M2PA would be to set one end to client and the other end to server. The signaling gateway provides the ability for both ends to operate as client; however in this case, the SECURE parameter must be set to Y.

See Section 7.2, “Signaling Configuration” on page 137 for a more detailed description of SIGTRAN signaling configuration.

Syntax

```
SNSLI:SNLINK=,SNTYPE=,IPADDR=,END=,[SS7MD=,NC=,]
      [IPADDR2=,][HPORT=,][PPORT=,][SRTX=,][LABEL=,][SECURE=,];
```

Prerequisites

- The SIGTRAN link has not already been initiated.
- An IP address of 0.0.0.0 cannot be specified.
- The IPADDR, HPORT, and PPORT combination must not be the same as that of a previously configured SNLINK.
- The END can only be Client (C) or Server (S).
- Both NC and SS7MD parameters must either be present or both parameters must not be present.
- The SS7MD associated with an NC cannot be different to a SS7MD associated with the same NC anywhere else in the system.
- If the SNTYPE is M2PA, SS7MD, and NC cannot be specified.

Limitations

None

Attributes

CONFIG

Examples

```
SNSLI:SNLINK=1,SNTYPE=SGM3UA,END=S, IPADDR=193.112.111.123;
SNSLI:SNLINK=2,SNTYPE=M2PA,END=C,IPADDR=193.112.111.123,
       IPADDR2=192.112.111.123;;
```

6.13.11 SNSLC – SIGTRAN Signaling Link Change

Synopsis

This command changes parameters on a SIGTRAN link. A SIGTRAN link provides an SCTP association to an adjacent SIGTRAN server.

If two IP addresses are specified, the first IP address is used until it proves unreliable in which case the second is used.

An IP address of 0.0.0.0 indicates that the parameter is not configured.

When SECURE is set to Y, the SIGTRAN link does not come into service on unblocking if it receives messaging from a peer that has an IP address not associated with the SIGTRAN link.

Note: Normal operation for M2PA would be to set both ends to client.

Syntax

```
SNSLC:SNLINK=,END=,[IPADDR=,][IPADDR2=,][HPORT=]
      [PPORT=,][SRTX=,][LABEL=,][SECURE=,];
```

Prerequisites

- The SIGTRAN link has already been initiated and is blocked.
- The END can only be Client (C) or Server (S).

Attributes

CONFIG

Examples

```
SNSLC:SNLINK=1, PPORT=2905;
```

6.13.12 SNSLE – SIGTRAN Signaling Link End

Synopsis

This command ends the configuration of parameters on a SIGTRAN signaling link.

Syntax

```
SNSLE:SNLINK=;
```

Prerequisites

- The SIGTRAN link has already been initiated and is blocked.
- The SIGTRAN link cannot be ended if it is attached to a Remote Application Server (RAS).
- There cannot be any NC/NA mapping configured on the SNLINK.
- The SNLINK cannot be ended if it is associated with a C7LINK.

Attributes

CONFIG

Examples

```
SNSLE:SNLINK=1;
```

6.13.13 SNSLP – SIGTRAN Signaling Link Print

Synopsis

This command prints the configuration of SIGTRAN signaling links.

Syntax

```
SNSLP:[SNLINK=][PAGE=,];
```

Prerequisites

- If specified, the SNLINK link has already been initiated.

Attributes

None

Examples

```
SNSLP:SNLINK=1;
```

Output Format

```
Page 1 of 2 SIGTRAN Signaling Link Configuration
SNLINK SNTYPE SG  END NC   SS7MD IPADDR          IPADDR2         LABEL
1      SGM3UA     S   1    ITU14 194.192.184.111 194.192.198.120 ASP1
2      SGM3UA     S   2    ANSI  111.143.134.122 111.111.123.100 ASP2
EXECUTED

Page 2 of 2 SIGTRAN Signaling Link Configuration
SNLINK HPORT PPORT SRTX SECURE LABEL
1      2905  2905  2    N      Dual
EXECUTED
```

6.14 Status Commands

The status commands include:

- STALP - Status Alarm Print
- STRAP - Status Remote Application Server Print
- STBOP - Status Board Print
- STCRP - Status C7 Route Print
- STC7P - Status C7 Link Print
- STDDP - Status Disk Drive Print
- STEPP - Status Ethernet Port Print
- STIPP - Status IP Print
- STLCP - Status Licensing Print
- STPCP - Status PCM Print
- STRDP - Status Remote Data Center Print
- STSLP - Status SIGTRAN Link Print
- STSYP - Status System Print
- STTPP - Network Time Protocol Status Print

6.14.1 STALP – Status Alarm Print

Synopsis

This command requests an alarm status report summary. The interpretation of the ID field in the listing is dependent on the alarm type (see Chapter 8, “Alarm Fault Code Listing”).

The fields have the following meanings:

- SYS - The number of system alarms
- PCM - The number of PCM alarms
- SIG - The number of signaling alarms
- CLA5 - The number of minor alarms
- CLA4 - The number of major alarms
- CLA3 - The number of critical alarms

Syntax

```
STALP;
```

Prerequisites

None

Attributes

None

Examples

```
STALP;
```

Output Format

```
Alarm Status

SYS PCM SIG CLA5 CLA4 CLA3
1   0   1    2    0    0
EXECUTED
```

6.14.2 STRAP – Status Remote Application Server Print

Synopsis

This command provides the status of SIGTRAN servers. It also provides the status of a link when it is serving the Remote Application Server (RAS).

Definitions of the RAS status:

- BLOCKED - The RAS is blocked.
- AVAILABLE - The RAS is available.
- UNAVAILABLE - The RAS is unavailable.
- INSUFF_ASP - The RAS is available but it has insufficient ASPs active as configured in SNRAP (only valid for load sharing).

Definitions of the ASP within the server:

- DOWN - The link attached to the server is down.
- ACTIVE - The link attached to the server is active.
- INACTIVE - The link attached to the server is inactive.

Definitions of TRMD (Traffic Mode):

- LS - Load sharing mode
- OR - Override mode
- BC - Broadcast mode

Syntax

```
STRAP:[RAS =…];
```

Prerequisites

None

Attributes

None

Examples

```
STRAP:RAS=1;
```

Output Format

```
Application Server Status
RAS   RAS STATUS    SNLINK   ASP STATUS    TRMD ASP ID     RAS LABEL
1     AVAIlABLE     1        ACTIVE        LS              AS1
2     AVAILABLE     2        DOWN          LS              AS2
2     AVAILABLE     3        INACTIVE      LS              AS2
3     BLOCKED
EXECUTED
```

6.14.3 STBOP – Status Board Print

Synopsis

This command requests a status report of boards on the system. Possible status values are:

- INACTIVE - The board is not in operation.
- RESETTING - The board is undergoing a reset.
- ACTIVE - The board is operational.
- FAILED - The board has failed and is out of service.

Syntax

```
STBOP:[BPOS=…];
```

Prerequisites

- If specified, the board should have already been initiated.

Attributes

None

Examples

```
STBOP:BPOS=1;
```

Output Format

```
Board Status
BPOS STATUS
Active
Failed
Blocked
EXECUTED
```

6.14.4 STCRP – Status C7 Route Print

Synopsis

This command shows the status of the specified SS7 route or range of routes within a network context. If no route or network context is specified, then the values for all routes are shown.

The command indicates whether a route is available or unavailable as well as indicating which routsets within the route are available or unavailable. The command also provides the congestion state of the route.

Possible ROUTE STATUS values are:

- Available
- Unavailable
- Available - The route is available for traffic to the remote point code of the route.
- Unavailable - The route is unavailable for traffic to the remote point code of the route.

Possible CONG LEVEL values are:

- 0 no congestion
- 1, 2 or 3 indicating the level of congestion

Possible LS1 STATUS and LS2 STATUS values are:

- Available - The linkset on the route is available for traffic to the adjacent point code.
- Unavailable - The linkset on the route is unavailable for traffic to the adjacent point code.

Syntax

```
STCRP;
STCRP:NC=;
STCRP:C7RT=,NC=;
```

Prerequisites

None

Attributes

None

Examples

```
STCRP;
```

Output Format

```
CCITT SS7 Route Status
C7RT NC DPC      ROUTE STATUS CONG LEVEL LS1 STATUS   LS2 STATUS   LABEL
1    1  1        Available    0          Available
2    1  2        Available    0          Unavailable  Available
64   4  99       Unavailable  0          Unavailable
EXECUTED
```

6.14.5 STC7P – Status C7 Link Print

Synopsis

This command requests a status report of the SS7 signaling links or SS7 link sets.

L2 STATUS - Possible values are:

- In service
- Out of service
- Proc outage
- Aligned rdy
- Init align
- Align not rdy

L3 STATUS - Possible values are:

- Available
- Unavailable
- Congested
- Deactivated (the link has been deactivated)
- Blocked (the link is blocked)

L3 BLOCKING STATUS - Possible values are:

- INHR - The link is remotely inhibited
- INHL - The link is locally inhibited
- BLKR - The link is remotely blocked
- COIP - Changeover is in progress
- CBIP - Changeback is in progress
- LIIP - Local link inhibiting is in progress
- LUIP- Local link uninhibiting is in progress

Syntax

```
STC7P:[PAGE=…][C7LINK=…];
STC7P:[PAGE=…][LS=…];
```

Prerequisites

None

Attributes

None

Examples

```
STC7P;
```

Output Format

```
CCS SS7 Signalling Link Status (Page 1 of 2)
C7LINK  LS      EQU     TS      SNLINK  L2 STATUS       L3 STATUS
1       1       1-3     1-3-16                          BLOCKED
2       1       1-4     1-4-16          IN SERVICE      AVAILABLE
3       2       3-3     3-3-16          INITIAL ALIGN   UNAVAILABLE
4       2       3-4     3-4-16          OUT OF SERVICE  DEACTIVATED
EXECUTED

CCS SS7 Signalling Link Status (Page 2 of 2)
C7LINK  L2 STATE        L3 STATE     L3 BLOCKING STATUS
1                       BLOCKED      ---- ---- ---- ---- ---- ---- ----
2       IN SERVICE      AVAILABLE    ---- ---- ---- ---- ---- LIIP ----
3       INITIAL ALIGN   UNAVAILABLE  ---- ---- ---- ---- ---- ---- ----
4       OUT OF SERVICE  DEACTIVATED  ---- ---- ---- ---- ---- ---- ----
EXECUTED
```

6.14.6 STDDP – Status Disk Drive Print

Synopsis

This command displays the status of all hard disk drives within the RAID array.

Note: This command is not available for the Dialogic® DSI SS7G21 and SS7G22 Signaling Servers.

Syntax

```
STDDP;
```

Prerequisites

None.

Attributes

None.

Example

```
STDDP;
```

Output Format

```
STDDP;
Disk Drive Status
DRIVE STATUS
0     UP
1     UP
EXECUTED
```

The STATUS field will display one of the following values:

- UP – The disk drive is operational. If the disk forms part of a RAID array then all the RAID devices on this drive are in an 'active sync state'.
- DOWN– The disk drive is non operational. If the disk forms part of a RAID array then one or more of the Raid devices on this drive is faulty.
- RESTARTING – One or more of the raid devices on this drive is synchronizing with another Raid device. The disk is considered 'non operational' until synchronization is complete.

- INACTIVE – The drive is not configured as part of the RAID array and therefore is not in use. This may be due to user action through MMI, the drive not being physically present at startup or a failed drive being removed by the operating software at startup from the RAID array.

Caution: Before replacing a failed drive, the drive must first be taken out of service using the MNINI command. Once the replacement drive is in place, the disk can be restored to service using the MNINE command. See Section 7.7, “Hard Disk Management” on page 146.

6.14.7 STEPP – Status Ethernet Port Print

Synopsis

This command provides the status of Ethernet ports on the system. The parameters output are:

- ETH - The Ethernet port identity.
- PARTNER - Identifies the other port member of a port bonding team.
- SPEED - The speed of the Ethernet port (10 / 100 / 1000).
- DUPLEX - Whether the port is FULL or HALF Duplex.
- STATUS - Whether the port is UP or DOWN. If the port is in a team, and it is “up”, the status indicates instead whether the port is ACTIVE or in STANDBY.

Syntax

```
STEPP;
```

Prerequisites

None

Attributes

None

Examples

```
STEPP;
```

Output Format

```
ETH PARTNER SPEED DUPLEX STATUS
1                    DOWN
2           100   FULL   UP
3   4       1000  FULL   ACTIVE
4   3       1000  FULL   STANDBY
EXECUTED
```

6.14.8 STIPP – Status IP Print

Synopsis

This command sends four ICPM (Internet Control and Management Protocol) Echo Request frames to the specified remote IP address and measures the maximum round trip time, similar to the standard Unix ping command. SEND shows the number of frames transmitted. RECV shows the number of replies received and MAXRTD shows the maximum delay between sending a frame and receiving a reply, in milliseconds. The measurement is accurate to 10ms, hence any value less than 10ms is displayed as ‘<10’. If the destination IP address is not reachable, RECV is shown as 0 and MAXTP as ‘-‘.

Syntax

```
STIPP:IPADDR=;
```

Prerequisites

None

Attributes

None

Examples

```
STIPP:IPADDR=173.132.23.3;
```

Output Format

```
IP Status
IPADDR                  SEND      RECV      MAXRTD
193.195.185.16          4         4         20
EXECUTED
```

6.14.9 STLCP – Status Licensing Print

This command prints the status of each license on the system.

The meaning of each field in the output is as follows:

- CAPABILITY — A licensable capability of the system. This may be a protocol license or an operating mode license. A capability may have been purchased as a software license, shipped as part of the system or bundled as part of another license.
- STATUS — Status of the capability on the system where:
  - NONE — This capability is not present. It requires a software license.
  - INACTIVE — The license is present but not running for software reasons e.g. The license is for a different mode of operation or the capability is dependant on another capability that is not active.
  - DEACTIVATED — The license is present but not running due to configuration reasons (it has been user deactivated in CNSYS).
  - ACTIVE — The license is active.
  - ERROR — This capability cannot be activated as it depends on a software license which his not present (e.g. TCAP is present but SCCP is not).
  - RESTART — The license is present but requires a system restart to allow activation.
  - CONGESTED — The throughput congestion level has been reached for the capability.
  - ENFORCED — The licensed traffic rate has been exceeded for a extended period and the system is now limiting traffic to the licensed rate for the capability.
- LINKS — The licensed number of links for the capability. Blank means not applicable.
- LICRATE — The licensed throughput rate in Kilobytes/s for the capability. Blank means not applicable.
- SHARERATE — the allocated throughput determined by the value of the M3UASHARE parameter. Blank means that M3UASHARE is also blank.
- CREDIT — The current throughput account credit if applicable. The throughput account credit is expressed as a % of the maximum account credit.

Note: The maximum account credit is the licensed throughput rate * 30. The throughput account credit is decremented each time traffic passes through the system. The throughput account is incremented every second by the value of the licensed throughput rate. If the licensed throughput is exceeded for a sustained period of time the credit available will drop. When the credit drops to 50% of the maximum throughput credit a congestion alarm will fire. When the credit drops to 0% (i.e. there is no credit left) throughput enforcement will occur limiting throughput to the licensed rate. Throughput enforcement will be maintained until the account credit returns to 75% or above of the maximum throughput credit.

Syntax

```
STLCP;
```

Prerequisites

None.

Attributes

None.

Examples

```
STLCP;
```

Output Format

```
stlcp;
Software License Capability Status
CAPABILITY   STATUS        LINKS   LICRATE  SHARERATE  CREDIT
SIU               INACTIVE
SGW              ACTIVE
DSC               NONE
SCTP             ACTIVE
M2PA             ACTIVE           256     2460          1844               75
M3UA             ACTIVE           256     2460           616                25
MTP               ACTIVE           192
SNMP           DEACTIVATED
EXECUTED
```

6.14.10 STPCP – Status PCM Print

Synopsis

This command requests a status report of the PCMs. The PCM status is one of the following:

- OK - Normal operational state
- PCM Loss - No signal sensed on the PCM input
- Sync Loss - Loss of frame alignment since no frame synchronization has been received
- RAI - Remote alarm indication. The remote end indicates that is it is OK, but also indicates that it is detecting an error condition.
- AIS - Alarm indication signal. The remote side sends all ones indicating that there is an error condition, or it is not initialized.
- BER > 1:10^3 - The PCM is encountering a Bit Error Rate (BER) of 10^3.
- BER > 1:10^5 - The PCM is encountering a BER of 10^5.

The Clock Status field is one of the following:

- OK - The board is detecting a valid PCM signal which could potentially be used for synchronization.
- Standby - The board is detecting a valid PCM signal which will be used for synchronization in the event of failure of the active clock source.
- Active - The board is detecting a valid PCM signal which is currently providing synchronization for the Signaling Gateway.
- Not OK – The input to the board is not currently suitable for use as a synchronization source.
- Fault - A fault has been detected on the board which prevents it being used as a synchronization source.

Syntax

```
STPCP;
```

Prerequisites

None

Attributes

CONFIG

Examples

```
STPCP;
```

Output Format

```
PCM Status
PCM SYNCPRI PCM Status  Clock
1-3 1       PCM Loss    Fault
1-4 2       SYNC Loss   Not OK
2-3 3       AIS         Not OK
2-4 4       RAI         OK
3-3 1       OK          Active
3-4 1       OK          OK
EXECUTED
```

6.14.11 STRDP – Status Remote Data Center Print

Synopsis

This command requests a status report for the Remote Data Centers (RDCs). The status can be one of the following:

- OK - The RDC is available to receive data.
- Initiating - Initiating connection to the RDC.
- Failed - The RDC is not available to receive data.
- Blocked - The RDC is user blocked from receiving data.

File transfer is to the lowest numbered available RDC.

> ***Note:*** If the system does not have an IPADDR, then status indicates OK for communication with the RDC; however, no data can be transferred.

Syntax

```
STRDP;
```

Prerequisites

None

Attributes

None

Examples

```
STRDP;
```

Output Format

```
Remote Data Centre Status
RDC  IPADDR           RDCSTAT
1    25.03.203.52     Initiating
2    102.03.211.140   OK
EXECUTED
```

6.14.12 STSLP – Status SIGTRAN Link Print

Synopsis

This command requests the status of a SIGTRAN link.

Definitions for the status of the peer signaling process (SP):

- BLOCKED - The signaling link is blocked.
- UNAVAILABLE - The signaling link is unavailable.
- AVAILABLE - The signaling link is available.

Note: The SP STATUS is blank for M2PA SNLINKs. Layer 2 status is provided by the STC7P command.

Definitions for SCTP Status are:

- CONFIGURING - Association is being configured.
- COOKIE_WAIT - Association is waiting for a cookie.
- COOKIE_ECHOED - Association has echoed a cookie.
- CLOSED - Association is closed.
- INITIATING - Association is initiating.
- ESTABLISHED - Association is established.
- SHUTDOWN_PENDING - Association is pending shutdown.
- SHUTDOWN_SENT - Association has sent shutdown.
- SHUTDOWN_RECEIVED - Association has received shutdown.
- SHUTDOWN_ACK_SENT - Association has shutdown.

Definitions of the status of Links IP Addresses are:

- INACTIVE - Network address is inactive.
- ACTIVE - Network address is available for data transfer.
- BLOCKED - Network address is blocked.

The Retransmission TimeOut (RTO) is a time between 500 and 6000 milliseconds where SCTP waits before retransmitting an octet to an IP address. The timeout dynamically changes based on line conditions and provides an indication on the quality of the connection to that IP address.

Syntax

```
STSLP:[SNLINK=…];
```

Prerequisites

- If specified, the SIGTRAN link should already have been initiated.

Attributes

None

Examples

```
STSLP:SNLINK=1;
```

Output Format

```
Page 1 of 2 SIGTRAN Signaling Link Status
SNLINK SP STATUS    SCTP STATUS  LABEL
1      AVAILABLE    ESTABLISHED
2      BlOCKED
EXECUTED

Page 1 of 2 SIGTRAN Signaling Link Status
SNLINK IPADDR STATUS IPADDR RTO IPADDR2 STATUS IPADDR2 RTO LABEL
1      ACTIVE        500        ACTIVE         1500
2      BlOCKED
EXECUTED
```

6.14.13 STSYP – Status System Print

Synopsis

This command provides a summary of the load, uptime and alarms on the system. The meaning of each field in the output is as follows:

- CPU - A string identifying the CPU type and speed
- MEMORY - The amount of RAM in the system
- UPTIME - The length of time the application software has been running
- NRESTART - The number of times the system has restarted since factory installation
- LOADAVG1 - The UNIX load average measurement taken over one minute
- LOADAVG5 - The UNIX load average measurement taken over five minutes
- LOADAVG15 - The UNIX load average measurement taken over 15 minutes
- ALMSYS - The number of system alarms
- ALMPCM - The number of PCM alarms
- ALMSIG - The number of signaling alarms
- ALMCLA1 - The number of minor alarms
- ALMCLA2 - The number of major alarms
- ALMCLA3 - The number of critical alarms

Syntax

```
STSYP;
```

Prerequisites

None

Attributes

None

Examples

```
STSYP;
```

Output Format

```
System Status
CPU          2 X Intel(R) Xeon(TM) CPU 2.4GHz
MEMORY       1024MB
UPTIME       01:04:43
NRESTART     307
LOADAVG1     1.48%
LOADAVG5     1.49%
LOADAVG15    1.45%
ALMSYS       0
ALMPCM       9
ALMSIG       4
ALMCLA1      0
ALMCLA2      13
ALMCLA3      0
EXECUTED
```

6.14.14 STTPP – Network Time Protocol Status Print

Synopsis

This command is used to display the status of the Network Time Protocol servers configured on the unit.

Syntax

```
STTPP;
```

Prerequisites

None.

Attributes

None.

Example

```
STTPP;
Status of NTP Servers
NTPSER IPADDR          STATUS      STRATUM OFFSET    LABEL
1     192.168.0.1     SYSPEER     3       -0.025594 NTPSERV1     2     192.168.0.2     ACTIVE     4
-0.025477 NTPSERV2
EXECUTED
```

Description

Meaning of fields in the print command:

- **Status**

Status	Description
INACTIVE	The NTP service is disabled.
UNREACHABLE	The NTP server is unreachable.
REJECT	The NTP server has been rejected by the server selection algorithm.
ACTIVE	NTP time information is being received from this server.
SYSPEER	NTP has selected this server to synchronize to.

- **Stratum**
  The NTP Stratum value reported by the NTP server.
- **Offset**
  The difference in seconds between the clock (UTC) as configured on the unit and the UTC time as reported by the NTP server.

Chapter 7: Configuration Overview

This section provides an overview of the various components that are used in the configuration of a Signaling Gateway and how these components relate to each other. The Signaling Gateway configuration is described in the following categories:

- System, Hardware and Signaling Configuration – The configuration of system Ethernet addresses, signaling boards and PCMs.
- Signaling Configuration – The transmission of messages on the SS7 and IP side.
- Routing Configuration – The route SS7 messages take through the gateway.
- Management and Operations – Bringing entities in and out of service and monitoring system status.
- Default Routing – Allocation of a default route to MTP.
- Resilience – Two Signaling Gateways acting as a single Point Code.
- Hard Disk Management.

7.1 System, Hardware and Signaling Configuration

7.1.1 System Configuration

Each Signaling Gateway contains four or six (depending on equipment type) Ethernet ports allowing it to communicate with four or six separate IP networks. The Ethernet interface is used for the transfer of SS7 signaling information over IP, for telnet communication with the management interface and the transfer of files (such as those for software update and configuration backup) using ftp between the Signaling Gateway and a remote server. By default the SCTP value on this 4th port (ETH 4) is set to N preventing the port from use for SIGTRAN traffic - this is configurable using the IPEPS command.

A Signaling Gateway can be given a presence within an IP network using its first Ethernet port configured with an IP Address (IPADDR) and a Subnet Mask (SUBNET). If the Signaling Gateway is communicating with a destination that is not on the local subnet, a default IP gateway (GATEWAY) can be configured.

Additional IP networks are configured on the remaining Ethernet ports using the IPEPS command and additional gateway set with the IPGWI command.

Figure 4. Multiple IP Networks

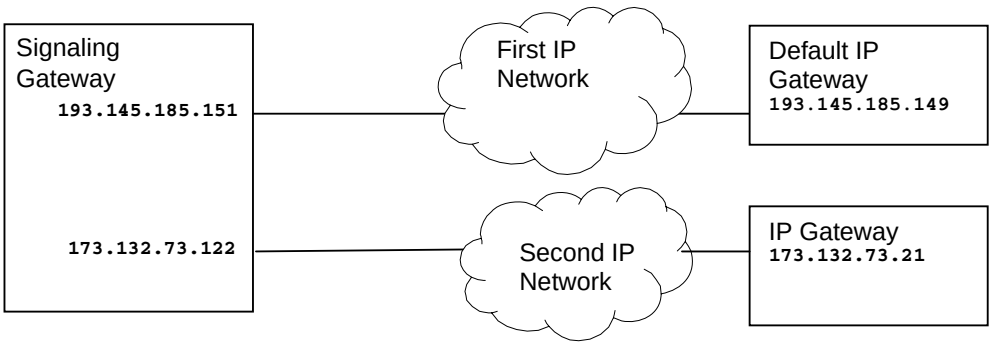


Figure 4 demonstrates the Signaling Gateway configured to exist in multiple IP networks. Example MML for the above configuration is:

```
IPEPS:ETH=1,IPADDR=193.145.185.151,SUBNET=255.255.255.0,SCTP=Y;
IPEPS:ETH=2,IPADDR=173.132.73.122,SUBNET=255.255.255.0,SCTP=Y;
IPGWI:IPGW=1,GATEWAY=193.145.195.149;
```

7.1.2 Boards and PCMs

A Signaling Gateway contains a number of SS7 signaling boards located in individual board positions (BPOS). Signaling boards are managed using the CNBOx commands.

A Dialogic® DSI SS7 Network Interface Board can terminate up to two PCM (PCM) trunks for connection to either a Signaling End Point (SEP) or Signaling Transfer Point (STP). When configuring the PCM, the user can specify whether it should act as E1 or T1 as well as its frame format (FF) and line code (LC). The configuration of a PCM also determines whether the port signal is to be used as the external clock synchronization source of the Signaling Gateway. Each PCM can be assigned a synchronization priority (SYNCPRI) specifying the priority it has within the Signaling Gateway to receive the external clock for the system. The PCM in the system with the lowest numbered synchronization priority that is active and in service provides the clocking source for the Signaling Gateway. If the current PCM providing clock for the system goes out of service, the PCM with the next highest clock priority that is in service provides clock for the Signaling Gateway. If a PCM's synchronization priority is set to 0, that PCM never provides clock for the system.

PCMs are managed using the CNPCx commands.

Figure 5. Physical Configuration

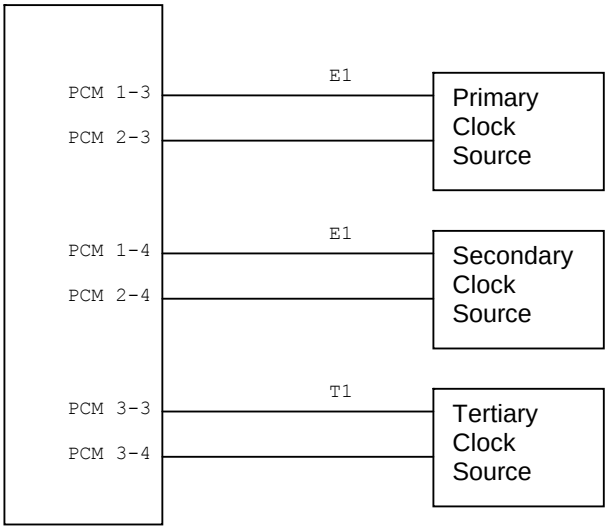


Figure 5 demonstrates a Signaling Gateway configured with three boards and six PCMs, four E1 and two T1 connect to primary, secondary and tertiary clock sources. Example MML for the above configuration is:

```
CNBOI:BPOS=1,BRDTYPE=SPCI2S-4-2,SIGTYPE=SS7;
CNBOI:BPOS=2,BRDTYPE=SPCI2S-4-2,SIGTYPE=SS7;
CNBOI:BPOS=3,BRDTYPE=SPCI2S-4-2,SIGTYPE=SS7;
CNPCI:PCM=1-3,PCMTYPE=E1,SYNCPRI=1;
CNPCI:PCM=2-3,PCMTYPE=E1,SYNCPRI=1;
CNPCI:PCM=1-4,PCMTYPE=E1,SYNCPRI=2;
CNPCI:PCM=2-4,PCMTYPE=E1,SYNCPRI=2;
CNPCI:PCM=3-3,PCMTYPE=T1,SYNCPRI=3;
CNPCI:PCM=3-4,PCMTYPE=T1,SYNCPRI=3;
```

7.2 Signaling Configuration

7.2.1 SS7 Configuration

A Link Set (LS) is the set of signaling links between an Originating Point Code (OPC) on the Signaling Gateway and an adjacent Destination Point Code (DPC). When specifying a link set the user can specify the MTP type and point code size (SS7MD), the SS7 Network Identifier (NI) and the logical network (NC) it belongs in. Link sets are managed using the C7LSx commands.

An SS7 Route (C7RT) identifies the link sets that are used to reach an eventual Destination Point Code (DPC). Two SS7 routes cannot have the same DPC within the same network. An SS7 route utilizes link sets (LS1 and LS2) to adjacent points to reach an eventual destination. An adjacent point can be a Signaling Transfer Point (STP), where SS7 information is forwarded on into the SS7 network, or the eventual destination. SS7 routes are managed using the C7RTx commands.

SS7 MTP2 Operation

An SS7 signaling link (C7LINK) processor (EQU) receives and transmits SS7 signaling information over a timeslot (TS) on an E1 or T1 bearer or a serial V.11 interface. An SS7 Signaling link is identified uniquely within an SS7 link set by the Signaling Link Code (SLC). Signaling links are managed using the C7SLx commands.

Figure 6. SS7 Signaling Example

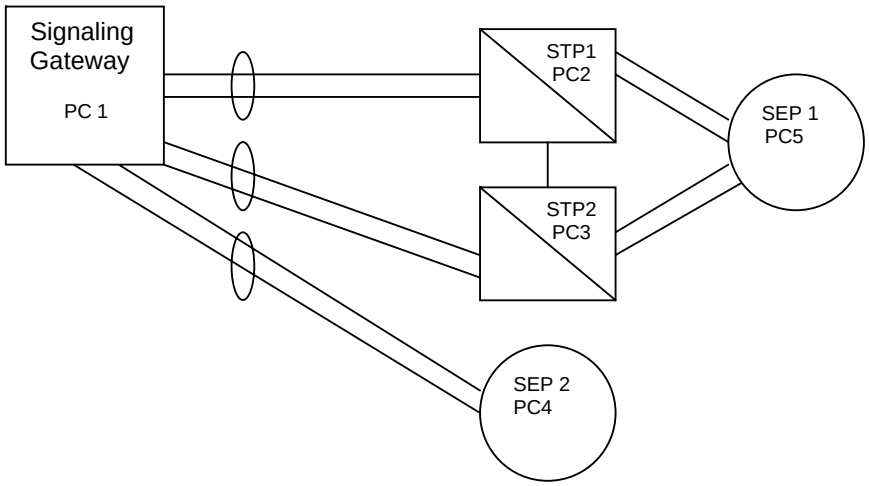


Figure 6 demonstrates a Signaling Gateway routing to two SS7 Signaling End Points (SEP). The first SEP is reached by a pair of STPs, while the second SEP is reached directly from the Signaling Gateway. Example MML for the above configuration is:

```
C7LSI:LS=1,OPC=1,DPC=2,SS7MD=ITU14,LSSIZE=2,NI=2,NC=1;
C7LSI:LS=2,OPC=1,DPC=3,SS7MD=ITU14,LSSIZE=2,NI=2,NC=1;
C7LSI:LS=3,OPC=1,DPC=4,SS7MD=ITU14,LSSIZE=2,NI=2,NC=1;
C7SLI:C7LINK=1,LS=1,EQU=2-1,TS=1-3-16,SLC=0;
C7SLI:C7LINK=2,LS=1,EQU=3-1,TS=2-3-16,SLC=1;
C7SLI:C7LINK=3,LS=2,EQU=2-2,TS=1-4-16,SLC=0;
C7SLI:C7LINK=4,LS=2,EQU=3-2,TS=2-4-16,SLC=1;
C7SLI:C7LINK=5,LS=3,EQU=2-3,TS=3-3-16,SLC=0;
C7SLI:C7LINK=6,LS=3,EQU=3-3,TS=3-4-16,SLC=1;
C7RTI:C7RT=1,NC=1,DPC=2,LS1=1,LABEL=STP1;
C7RTI:C7RT=2,NC=1,DPC=3,LS1=2,LABEL=STP2;
C7RTI:C7RT=3,NC=1,DPC=4,LS1=3,LABEL=SEP2;
C7RTI:C7RT=4,NC=1,DPC=5,LS1=1,LS2=2,LABEL=SEP1;
```

7.2.2 High Speed Signaling Links Configuration

The Signaling Gateway supports HSL in accordance with ITU Q.703 Annex A. Two HSL links are configurable on a Dialogic® DSI SS7HDP Network Interface Board using processor (EQU) values of **x-1** or **x-33** (x is the board position).

The timeslot on the C7SLx TS parameter must be set to 0 for a HSL link, that is the timeslot for a HSL link must be set to **x-y-0** (x is the board position, y is the PCM value).

Only an HSL link can be configured on an unstructured PCM, and a T1 HSL link must be received on the same board as it is processed. Additionally, an SS7 link cannot be changed from HSL to LSL or from LSL to HSL. A timeslot (TS) can only be associated with a structured HSL link if it is not associated with a signaling link, cross connect, monitoring or circuit group.

The following commands demonstrate HSL board, PCM and signaling link configuration.

```
cnboi:bpos=1,brdtype=ss7hdp-64-4,sigtype=ss7;
cnpci:pcm=1-1,pcmtype=e1,ff=uns;
cnpci:pcm=1-2,pcmtype=e1;

c7lsi:ls=1,nc=1,opc=10,dpc=20,ni=2,lssize=2,ss7md=itu14;
c7sli:c7link=1,equ=1-1,ts=1-1-0,ls=1,slc=0,m56k=0,hsl=y;
c7sli:c7link=2,equ=1-33,ts=1-2-0,ls=1,slc=1,m56k=0,hsl=y;
```

7.2.3 SS7 M2PA Operation

The Signaling Gateway is capable of replacing TDM SS7 links with signaling links operating over IP providing the equivalent functionality to MTP layer 2 by using the SIGTRAN M2PA protocol. Typically M2PA signaling links would be used when the Signaling Gateway is either offering longhaul over IP operation between two SEPs, or when two Signaling Gateways are acting as a single Point Code and the inter Signaling Gateway SS7 link is provided by M2PA over IP.

For M2PA operation, rather than associating an EQU or TS with an SS7 signaling link (C7LINK), the SS7 link is instead associated with a SIGTRAN link (SNLINK) defined to be of type M2PA. The SIGTRAN link is used to identify a SCTP Association as being used for M2PA operation.

Figure 7. M2PA Example

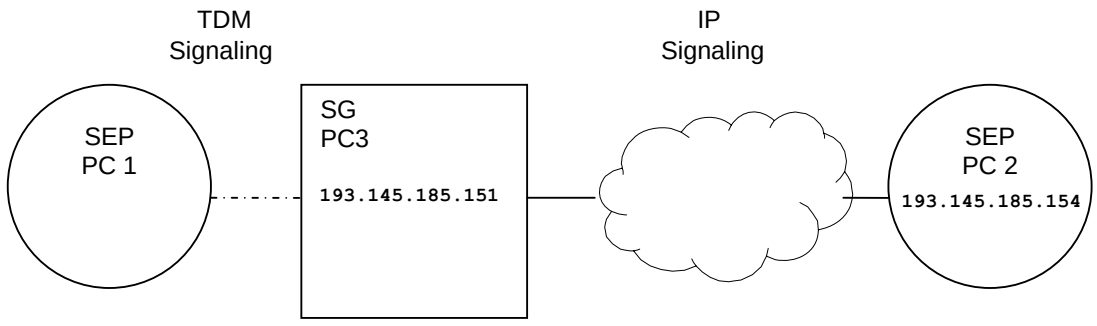


Figure 7 shows an example of a Signaling Gateway connected to a SEP on the TDM side and a SEP on the IP side.

Example MML for the SIGTRAN M2PA part of the above configuration is:

```
SNSLI:SNLINK=1,SNTYPE=M2PA,END=C,IPADDR=194.192.185.11,
      HPORT=3565,PPORT=3565,LABEL=SEP2-1;
SNSLI:SNLINK=2,SNTYPE=M2PA,END=C,IPADDR=194.192.185.11,
      HPORT=3566,PPORT=3566,LABEL=SEP2-2;
C7LSI:LS=2,OPC=3,DPC=2,LSSIZE=2,SS7MD=ITU14,NC=1,NI=2;
C7SLI:C7LINK=3,SNLINK=1,LS=2,SLC=0;
C7SLI:C7LINK=4,SNLINK=2,LS=2,SLC=1;
C7RTI:C7RT=2,NC=1,DPC=2,LS1=2;
```

7.2.4 M3UA Configuration

The Signaling Gateway employs M3UA to “backhaul” SS7 information to an SS7 resident application. The Signaling Gateway uses the Stream Control Transmission Protocol (SCTP) to provide a reliable transport protocol operating on top of IP. The relationship between the SCTP node on the Signaling Gateway and a peer node is known as an “association”. The Signaling Gateway employs the M3UA protocol to support the transport of any SS7 MTP3 user signaling (for example, ISUP and SCCP messages) over IP using the services of SCTP.

In backhaul operation, the Signaling Gateway communicates over an SCTP association using M3UA to an Application Server Process (ASP). An ASP is a host computer serving as an active or backup process of an Application Server (for example, part of a distributed virtual switch or database). Examples of ASPs are processes (or process instances) of MGCs, IP SCPs or HLRs. An ASP is an SCTP endpoint and may be configured to process signaling traffic within more than one Application Server.

A SIGTRAN link (SNLINK) identifies both the SCTP Association and the peer ASP that uses the Association.

The user can configure the Peer IP addresses (IPADDR, and optionally IPADDR2, a second IP address for resilience), a host port (HPORT) and a peer port (PPORT). The user can also configure the SIGTRAN link to act as an IP client or IP server (END), the network the SIGTRAN link exists in (NC) and the Point Code format that the SIGTRAN link uses (SS7MD). SIGTRAN links are managed using the SNSLx commands.

A Remote Application Server (RAS) is the logical entity serving a specific “routing key”. An example of an Application Server is a virtual switch element handling all call processing for a unique range of PSTN trunks, identified by an SS7 DPC/OPC/CIC range. Another example is a virtual database element, handling all HLR transactions for a particular SS7 DPC/OPC/SCCP SSN combination.

The Application Server contains a set of one or more unique SNLINKs of which one or more is normally actively processing traffic. There is a 1:1 relationship between an Application Server and a specific “routing key”. The user can configure an Application Server’s Destination Point Code (DPC) of the routing key as well as the Routing Context (RC) that uniquely identifies the routing key to the peer host application across the SIGTRAN link.

Application Servers are managed using the SNRAx commands and are associated to SIGTRAN links using the SNALx commands.

Figure 8. M3UA Backhaul Example

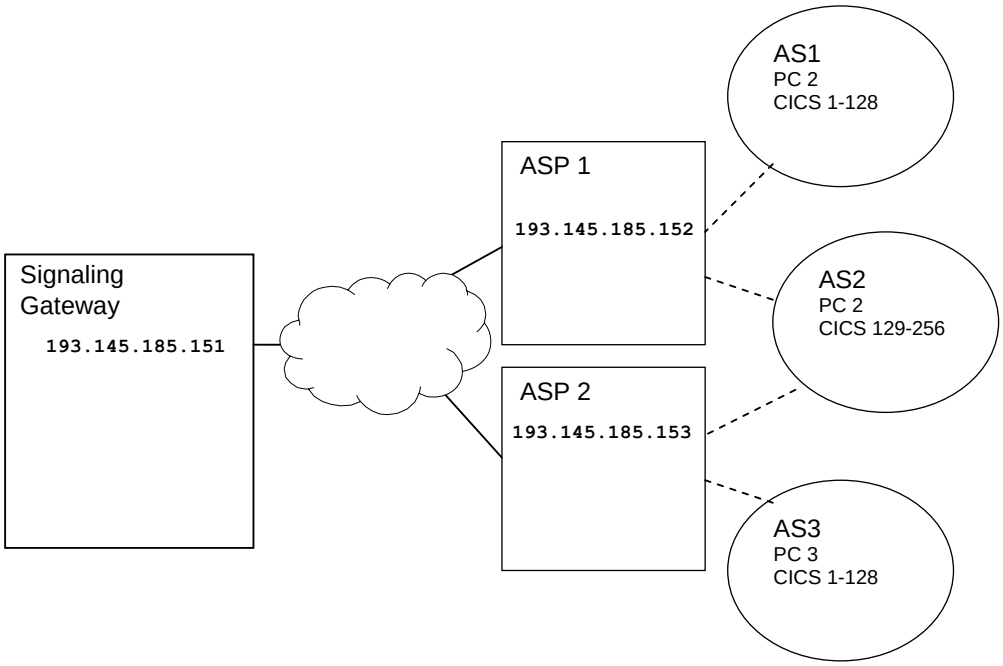


Figure 8 demonstrates a Signaling Gateway communicating over SIGTRAN links with two ASPs. ASP 1 is running two AS instances, AS1 processes CICs 1 to 128 in PC 2, and AS2 processes CICs 129 to 256 also in PC 2. ASP 2 is also running two AS instances, AS3 processes CICs 1 to 128 in PC 3 and AS2 processes CICs 129 to 256 also in PC 2. Note that AS2 is running on ASP1 and ASP2. The two ASPs could be load sharing processing for the AS or one could be active, while the other standby. The configuration of load sharing is performed by the ASPs. Example MML for the above configuration is:

```
Linkparatext: SNLINK=1, SNTYPE=SGM3UA, END=S, IPADDR=193.145.185.152,
       SS7MD=ITU14, NC=1, LABEL=ASP1;
Linkparatext: SNLINK=2, SNTYPE=SGM3UA, END=S, IPADDR=193.145.185.153,
       SS7MD=ITU14, NC=1, LABEL=ASP2;
Linkparatext:RAS=1, NC=1, DPC=2, RC=1, LABEL=AS1;
Linkparatext:RAS=2, NC=1, DPC=2, RC=2, LABEL=AS2;
Linkparatext:RAS=3, NC=1, DPC=3, RC=3, LABEL=AS3;
Linkparatext:RAS=1, SEQ=1, SNLINK=1;
Linkparatext:RAS=2, SEQ=1, SNLINK=1;
Linkparatext:RAS=2, SEQ=2, SNLINK=2;
Linkparatext:RAS=3, SEQ=1, SNLINK=2;
```

7.3 Routing Configuration

The routing model for the Signaling Gateway can be broken into three parts; incoming route selection, routing key processing and destination selection.

An Incoming Route (IR) identifies the side from which signaling data originates. MTP messages are considered to arrive from either the MTP domain over an SS7 link set (LS) using MTP2 or M2PA SS7 links (C7LINK) or the SIGTRAN IP domain over a M3UA SIGTRAN link (SNLINK). The SS7 link set or M3UA SIGTRAN link identifies the network (NC) and SS7 format (SS7MD) of the message. The IR configuration either explicitly identifies a destination or a routing key table (RKTAB) that is used to identify a destination (DEST). Incoming routes are managed using the SGIRx commands.

If the Signaling Gateway determines that a Routing Key Table (RKTAB) should be looked up, data from the message is compared with routing keys components (such as NC, SI, NI, OPC, DPC, CICs) in a routing key table. If a match is found and the Destination Point (DEST) for that routing key combination is in service, the routing key's Destination Point is used otherwise if the incoming route also had a Destination Point associated with it, then that default destination is used. Routing keys are managed using the SGRKx commands.

A Destination Point (DEST) can route a message to a Remote Application Server (RAS) or to MTP (using MTP2 or M2PA SS7 links) for routing based on Point Code. MTP routing can be selected by specifying an RTPRI of MTP. RAS routing can be selected by specifying an RTPRI of NONE and identifying the RAS that the messages should be routed to. Destinations are managed using the SGDPx commands.

Note: In many configurations, routing key analysis is not required and the user can configure an Incoming Route to go directly to a Destination without having to explicitly provide routing key information, such as Destination Point Codes, for every eventual destination.

Figure 9. Routing Configuration Example

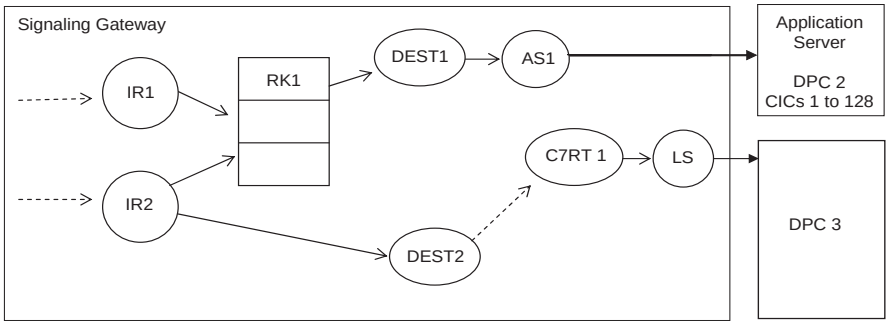


Figure 9 demonstrates example relationships between entities in the routing model. Relationships with full lines indicate that there is an explicit relationship between the entities (that is, one entity selects the other). Relationships with dotted lines indicate that the relationship is implicit, for example, if data arrives on a SIGTRAN link over M3UA, it is implicitly coming from the SIGTRAN IP domain and similarly if data arrives on an SS7 link set, it is implicitly arriving from the MTP domain.

Note: A message arriving from M2PA is considered as arriving from the MTP domain.

This example identifies two incoming routes, IR 1 from SIGTRAN IP and IR 2 from the MTP side. IR 1 and IR 2 go to the Routing Key Table 1 for routing key analysis. If the analysis fails, or the destination found by the analysis (Application Server AS1) is out of service, the Signaling Gateway discards messages from IR 1. The Signaling Gateway however attempts to route messages from IR 2 to Destination 2 only discards those messages if the SS7 route C7RT 1 is also out of service.

This example identifies two incoming routes, IR 1 from SIGTRAN IP and IR 2 from the MTP side. IR 1 goes to Routing Key Table 1 for routing key analysis. IR 2 also goes to Routing Key Table 1 for analysis, however, if analysis fails, or the destination found by analysis (either a MTP or SIGTRAN IP route or Application Server) is out of service, it attempts to route to Destination 2.

The routing key table has one entry as follows:

- The entry that routes all SS7 messages with DPC 2 and CICs 1 to 128 to Destination 1.

There are two Destinations:

- Destination 1 routes to Application Server 1.
- Destination 2 routes all messages to the MTP side.

Example MML for the routing part of the above configuration is as follows:

Note: The Destinations Point are configured first, followed by the Routing Key Tables, and then finally the Incoming Routes.

```
SGDPI:DEST=1,RTPRI=NONE,RAS=1;
SGDPI:DEST=2,RTPRI=MTP;
SGRKI:RKI=1,RKTAB=1,DPC=2,BCIC=1,RANGE=128,NC=1,DEST=1;
SGIRI:IR=1,NC=1,DOMAIN=IP,RKTAB=1;
SGIRI:IR=2,NC=1,DOMAIN=MTP,RKTAB=1,DEST=2;
```

7.4 Management and Operations

Entities such as boards, SS7 links, SIGTRAN links and Application Servers after configuration are considered to be in the “blocked” state. The configuration exists in the system for these entities, but these entities are not considered to be active. To activate an entity, the MNBLI command should be used. To temporally deactivate an entity, the MNBLE command should be used.

The status of entities such as boards, SS7 links, SIGTRAN links and Application Servers can be examined using the STxxx set of commands.

Alarms that occur on the Signaling Gateway can be view using the ALLOP and ALLIP commands.

7.5 Default Routing

The Signaling Gateway offers a Default Routing service. This service allows the Signaling Gateway to onward route MTP Message Signal Units (MSUs) with unknown Destination Point Codes (DPCs). It also provides a mechanism for Signaling Network Management messages to be generated for unknown Point Codes.

Figure 10 shows a typical system that uses Default Routing. The SPCs with Point Codes 1, 2 and 3 can each communicate with many Point Codes within the MTP Network not all of which the Dialogic® DSI Signaling Server has been configured to know about. The Signaling Server connects to two STPs that have been explicitly configured to know about more Point Codes than the Signaling Server.

7.5.1 Configuring Default Routing

Default Routing is configured using the C7RTI command with the DPC parameter set to “DFLT”. An additional route is configured with the LS1 and LS2 parameters identifying the link sets to the STPs and the PC set to DFLT.

Routing MSUs

When the Default Route is configured, on receipt of an MSU for an unknown DPC, the message is sent out on an available link set in the Default Route or discarded.

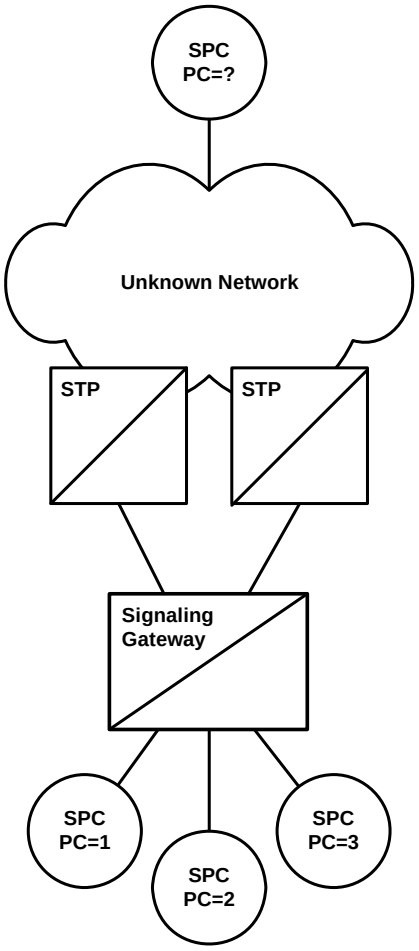
Route Set Test

SEPs send the Signaling Gateway RST messages for unknown Point Codes. The Signaling Server regenerates these messages and sends them to the STPs that responds to the Signaling Gateway with appropriate SNM messages.

Transfer Prohibited/Transfer Allowed

On receipt of TFA or TFP from one of the STPs in the Default Route, the Signaling Gateway regenerates and broadcasts these to all SEPs not in the Default Route.

Figure 10. System Using Default Routing



7.6 Resilience

7.6.1 IP Port Bonding

The Signaling Gateway allows the user to configure a resilient IP connection across an IP port bonding team of two ports in an active/standby configuration. On the Dialogic® DSI SS7G21, SS7G22 and SS7G31 Signaling Servers, up to two port bonding teams may be created using the four Ethernet ports on the SGW. The Dialogic® DSI SS7G32 Signaling Server has 6 Ethernet ports, allowing up to three port bonding teams. Each team has a single IP address configured with a primary (active) and secondary (standby) port. Any IP port on the system may be the primary port in a team and any port may be the secondary port. The primary port is a port configured with the IP address of the team and the secondary port is a port configured with a string to associate it with the primary port.

If the system detects that the Primary port has failed, it passes the primary's MAC and Layer 3 address to the failover (secondary) adapter, enabling it to act as the active port in the team. On the restoration of the primary port, the secondary port is removed from service and the primary port resumes control of its MAC and IP addresses.

The subnet mask of a secondary IP address in a team is ignored. Data loss may occur between the actual failure of an IP connect and the detection of that failure and subsequent switching to the standby port. All adapters in a team should be connected to the same hub or switch with Spanning Tree (STP) set to **off**.

Whenever teaming is activated, or deactivated, MMI sessions using those ports are reset. An IP address may not be teamed with:

- itself
- an IP address of 0.0.0.0
- another IP address already acting as a primary or standby in an IP team

Once configured the status of Ethernet ports in a bonded team may be checked using the STEPP command (see Section 6.14.7 on page 127).

7.6.2 Dual Resilient Operation

Two Signaling Gateways have the ability to work in conjunction with one another to realize a single SS7 signaling point where the operation of the Message Transfer Part (MTP) is distributed. Failure (or planned maintenance) of one or other of the Signaling Gateways operating in "Dual Mode" therefore does not result in a loss of SS7 signaling capability.

The use of the dual functionality does introduce some restrictions that are described below. The user is responsible for ensuring that these restrictions are acceptable, otherwise the dual mode of operation may not be applicable.

7.6.2.1 Overview of Dual Resilience

The dual Signaling Gateway solution assumes that each Signaling Gateway has one (or more) signaling links facing the network.

The ability for each of the Signaling Gateways to communicate with each other is addressed by adding an additional link set (containing one or two links, for example LS2 in Figure 11, "Dual Resilient Operation" on page 145) between the two platforms. This link set is used to convey network status and management messages between the two halves of the system and to pass signaling traffic as necessary.

On each Signaling Gateway, there is (a minimum of) two link sets, one connected to the adjacent signaling point and the other connected to the other half of the dual pair. Each MTP route is configured so that the primary link set is the link set connected to the adjacent signaling point and the secondary link set is the link set connected to the partner Signaling Gateway. Load sharing across these link sets is disabled.

The link set between the two halves of the dual Signaling Gateway is configured so that the originating and destination point codes are identical.

Under normal circumstances, messages that have been determined for the SS7 network are routed directly over the link set that connects to the adjacent signaling point. Under failure conditions, when the link to the adjacent signaling point is not available, the traffic messages are sent instead on the secondary link set to the partner Signaling Gateway. On receipt of these messages, the partner Signaling Gateway recognizes that the message is not destined for itself and transfers the message to its network-facing link set.

The signaling that takes place between each half of the dual Signaling Gateway system makes use of two reserved Network Indicator values in the Sub-Service Field, these values designated “National - Reserved” and “International - Reserved” must therefore not be used for signaling either to or from the network.

The link set between the two halves of the dual pair now becomes a key element in the system, and to avoid a single point of failure, this link set should contain at least two signaling links. Where possible, these links should be located on different signaling boards.

7.6.2.2 Configuration

Each half of the dual configuration needs to be configured separately using existing configuration techniques and noting the following.

The additional link set between the two Signaling Gateways should have the local point code and the adjacent point code set to the same value.

Each route to a destination signaling point should be configured to use the network link set as the primary link set and the inter Signaling Gateway link set as the secondary link set. Load sharing must be disabled.

When connecting to a pair of adjacent STPs, each STP must have a route declared on each Signaling Gateway and in all cases the inter-Signaling Gateway link set must be specified as the secondary link set.

A route must be configured to the other half of the dual Signaling Gateway system, this must use the inter-Signaling Gateway link set as the only link set.

In addition, the link set between the two halves of the dual Signaling Gateway system must be designated as a “special” link set. The method of achieving this depends on the equipment and configuration tools in use as follows:

Use the C7LSI command to initiate a link set with the same values for the OPC and DPC parameters and the value of the DUAL parameter set to zero.

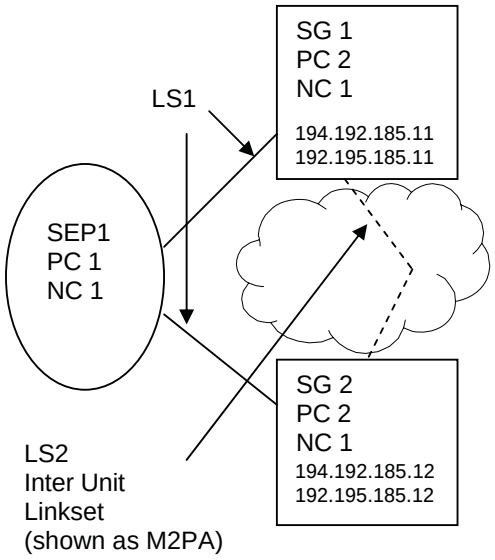
7.6.2.3 M2PA Inter Unit Signaling Links

The Signaling Gateway supports the use of M2PA SIGTRAN links for inter Signaling Gateway communication. M2PA SS7 links use the SCTP IP protocol to transmit signaling data. The use of IP links between the units (rather than TDM SS7 links) allows the systems to be able to present a greater number of TDM links and PCMs to face the SS7 network. In addition, since the Signaling Gateway supports two IP ports and M2PA supports IP multihoming, resilience between the units can be gained using redundant IP networks rather than the two SS7 boards that would be required to offer the same level of resilience.

7.6.2.4 Example

Figure 11 is an example of a DUAL resilient configuration using M2PA links for the resilient links between units.

Figure 11. Dual Resilient Operation



On Signaling Gateway 1, configure the IP addresses as follows and restart:

```
IPEPS:ETH=1,IPADDR=194.192.185.11;
IPEPS:ETH=2,IPADDR=192.192.185.11;
```

On Signaling Gateway 1, configure the link sets as follows:

```
C7LSI:LS=1,OPC=2,DPC=1,LSSIZE=2,SS7MD=ITU14,NI=2,NC=1;
C7LSI:LS=2,OPC=2,DPC=2,LSSIZE=2,SS7MD=ITU14,NI=2,NC=1;
```

On Signaling Gateway 1, configure the SIGTRAN link as follows:

```
SNSLI:SNLINK=1,SNTYPE=M2PA,IPADDR=194.192.185.12,
IPADDR2=192.195.185.12,END=C;
```

On Signaling Gateway 1, configure the signaling links as follows:

```
C7SLI:C7LINK=1,EQU=1-1,TS=1-1-1,LS=1,SLC=0;
C7SLI:C7LINK=2,SNLINK=1,LS=2,SLC=0;
```

On Signaling Gateway 1, configure the SS7 routes as follows:

```
C7RTI:C7RT=1,DPC=1,LS1=1,LS2=2,NC=1,LABEL=SEP1;
C7RTI:C7RT=2,LS1=2,DPC=2,NC=1,LABEL=INTERLINK;
```

On Signaling Gateway 2, configure the IP addresses as follows and restart:

```
IPEPS:ETH=1,IPADDR=194.192.185.12;
IPEPS:ETH=2,IPADDR=192.192.185.12;
```

On Signaling Gateway 2, configure the link sets as follows:

```
C7LSI:LS=1,OPC=2,DPC=1,LSSIZE=2,SS7MD=ITU14,NI=2,NC=1;
C7LSI:LS=2,OPC=2,DPC=2,LSSIZE=2,SS7MD=ITU14,NI=2,NC=1;
```

On Signaling Gateway 2, configure the SIGTRAN link as follows:

```
SNSLI:SNLINK=1,SNTYPE=M2PA,IPADDR=194.192.185.11,
IPADDR2=192.195.185.11,END=C;
```

On Signaling Gateway 2, configure the signaling links as follows:

```
C7SLI:C7LINK=1,EQU=1-1,TS=1-1-1,LS=1,SLC=1;
C7SLI:C7LINK=2,SNLINK=1,LS=2,SLC=0;
```

On Signaling Gateway 2, configure the SS7 routes as follows:

```
C7RTI:C7RT=1,DPC=1,LS1=1,LS2=2,NC=1,LABEL=SEP1;
C7RTI:C7RT=2,LS1=2,DPC=2,NC=1,LABEL=INTERLINK;
```

Linkset 1 is configured for both Signaling Gateways and has a destination point code of the SS7 switch.

Linkset 2 is a special linkset that has the same OPC and DPC. It is used to route messages destined for CICs on the partner Signaling Gateway.

C7 route 1 is used to route calls from the Signaling Gateways to the SS7 switch, if LS1 is not available, the signaling is routed via the partner Signaling Gateway using LS2. This is the C7 route assigned to circuit groups.

7.6.3 Multihoming

An inherent property of the SCTP layer on the Signaling Gateway that is used in SIGTRAN Signaling (for example, SS7 over M2PA) is that it supports IP multihoming. IP multihoming allows the SIGTRAN signaling link SCTP association to be configured to communicate with multiple IP addresses in an active/standby relationship. Multihoming offers a SIGTRAN signaling link significantly greater resilience since the link can be configured with multiple IP addresses to operate over separate Ethernet ports within wholly separate IP networks. IP ports and local IP addresses on the Signaling Gateway may be configured using the IPEPS command (see page 86). SIGTRAN links may be configured to communicate with multiple remote IP addresses using the SNSLI command (see page 119).

7.7 Hard Disk Management

7.7.1 SS7G21 and SS7G22 Hard Disk Drives

Backup and restoration of the SS7G2x environment can be used in conjunction with the spare hard drive to restore a system to full operation in the event of hard disk failure. A backup may also be useful to take a snapshot of a known working system prior to significant change, or for diagnostics purposes providing files to the support channel for further investigation in the event of problems occurring on their system.

For more information about backing up SS7G2x hard drives, see Section 4.14, “Creating a System Archive” on page 35.

Note: The SS7G2x spare hard disk, SS7G20SHDD, is an orderable product containing the operating system for the SS7G2x. The SS7G20SHDD is system neutral and requires a backed-up system license to bind it to a particular SS7G2x. The SS7G20SHDD will not function without a valid system license. If you want to take up the additional redundancy offered by a spare hard disk you must ensure that you have an archive of at least the system license prior to any potential failure of a hard disk.

7.7.2 SS7G31 and SS7G32 Hard Disk Drive RAID Array

The SS7G31 and SS7G32 systems are equipped with 2 mirrored hard disk drives configured in RAID 1 array (Redundant Array of Independent Disks). These disks will remain synchronized, ensuring that an up-to-date copy of all data on the disk drives (such as the operating system software, Dialogic® DSI signaling software, system licenses and configuration files) will be maintained on both disks. In the event of failure of a single drive, the Signaling Server will continue to support all the capabilities of the Signaling Server. When the failed disk drive is replaced with a unformatted disk drive, following the procedure below, the Signaling Server will mirror the operating software and data onto the new drive.

In the event of hard disk failure, the system will alarm, identifying the disk as unavailable. On the SS7G31 systems, the disk drive must be deactivated using the MNINI command (see Section 6.9.3 on page 94) before the unit is shut down, and the hard drive removed and replaced. For the SS7G32 the disk drive must be deactivated but the unit does not require to be shut down.

Refer to hard disk drive removal instructions in the *Dialogic® DSI SS7G31 and SS7G32 Signaling Servers Hardware Manual*. Once the disk has been replace and, in the case of the SS7G31, the system restarted the replacement drive should be activated using the MNINE command (see Section 6.9.4 on page 94), at which time the system will perform a synchronization function copying all software to the newly installed disk drive. The 'disk unavailable' alarm will persist until both disk drives are synchronized. The disk unavailable alarm will persist even if a failed disk drive is removed and not replaced.

Spare hard disk drives for the SS7G31 and SS7G32 system are available as on orderable part. Refer to the *Dialogic® DSI SS7G31 and SS7G32 Signaling Servers Product Data Sheet* (navigate from http://www.dialogic.com/products/signalingip_ss7components/signaling_servers_and_gateways.htm) for part number information.

Important: Although the RAID management software has been designed to be robust it is important to follow the removal and replacement procedures described above in order to ensure RAID array hard disk drive integrity.

Warning: USB storage devices should not be connected to the Signaling Server during hard disk drive removal and replacement. Verify that all attached USB storage devices are removed before performing HDD removal, replacement and re-activation.

Disk drive replacement should be performed during a scheduled maintenance period and, for the SS7G32, which supports hot swap, during a period of light traffic. re-synchronization of disk drives subsequent to replacement can take between 5-10 minutes, depending on the conditions and load under which the Signaling Server is operating. The Signaling Server should not be restarted during this period and MMI activity should be limited to checking the status of the re-synchronization. The status of the disk drives can be identified using the STDDP command (see Section 6.14.6 on page 126). A status of UP indicates that a drive is fully operational, a status of DOWN indicates either that the disk is faulty or otherwise unable to Synchronize. A status INACTIVE indicates that is has been deactivated by the user, a status of RESTARTING indicates that it is attempting to synchronize but the operation is not yet complete.

If the server is restarted through power loss or user action while synchronization is in progress the synchronizing disk will be in an indeterminate state and on restart may cause the server to fail to boot. In such an event the disk should be removed from the server and any formatting on the disk manually removed. The disk should be re-installed on the server and the system booted. To restart synchronization the user should deactivate (MNINI) and the re-active (MNINE) the disk. On the SS7G32 the disk does not need to be re-formatted instead the user should simply boot without the disk, insert it when the system is operational and re-activate synchronization using MNINI/MNINE.

If a disk drive remains in the 'DOWN' state after attempting re-activation, either the replacement drive is faulty or it has previously been formatted (RAID will only function with unformatted drives). In the case of the SS7G32, RAID mirroring may also fail and the disk remain 'DOWN' due to the action of the hot-swap. If this occurs the Server should be restarted and synchronization re-activated using MNINI/MNINE.

Chapter 8: Alarm Fault Code Listing

A system operator can obtain a listing of the current alarm status (class, category and ID) of a Dialogic® DSI Signaling Server using the ALLIP management terminal command described in Section 6.4.4, "ALLIP" on page 51 or a log of current and cleared alarms using the ALLOP management terminal command described in Section 6.4.5, "ALLOP" on page 52. Table 10 details the possible alarm types accessed by the ALLIP command. Alarm status/events may also be accessed/reported by front panel LEDs, relay connections and SNMP, as described in Section 1.9.6, "Alarm Log" on page 14.

Note: The meaning of individual event codes (in particular, the coding of the DIAG field) may be changed in subsequent releases of the Signaling Gateway software without prior notification.

Table 10. Alarm Fault Codes

Severity (LED)	CODE	Name	Event Description	CATEGORY	ID	Class †	DIAG
Critical (CRT)	11	Link set fail	All signaling links in an SS7 signaling link set have failed. Usually due to incorrect configuration (Point Codes or signaling timeslots), connectivity fault or inactive signaling terminal at the remote end.	SIG	LS	3	0
Critical (CRT)	12	Board failure	The Signaling Gateway has detected a fault with a signaling processor. This may either be due to a faulty signaling processor board or due to the Signaling Gateway performing a controlled shutdown of a signaling processor following persistent overload of the processor in order to prevent the overload affecting the remainder of the system. Usually due to faulty board (which can be confirmed by changing SS7 links to an alternative processor board using the C7LSC command) or unusual signaling conditions which may be due to incorrect configuration or a mismatch of configuration between the Signaling Gateway and the remote end. This alarm condition can only be cleared by manual intervention, the user should block and unblock the affected board. Note that a Processor Fail entry always appears in the alarm log when a board is unblocked, this condition is identified by an event with identical Occurred and Cleared times.	SYS	BPOS	3	0
Critical (CRT)	14	Self Test fail	The Signaling Gateway has detected a self test failure which prevents normal operation.	SYS	0	3	0
Critical (CRT)	18	Alarm Test 3	This event indicates that the user has invoked the alarm test for alarm class 3 using the ALTEI command.	SYS	0	3	0
Critical (CRT)	32	Overload	The Signaling Gateway has detected the onset of an internal overload condition. This is usually due either to exceptionally high traffic rates or failure conditions causing additional invocation of maintenance procedures. During overload the Signaling Gateway will continue to operate as normal. Should the condition occur on a frequent basis (for example, during the busy hour every day) the condition should be reported to your support representative.	SYS	0	3	0
Critical (CRT)	41	All RDC fail	Failure of communication with all remote data centers. Continuous records are written to hard disk or discarded as appropriate. Periodic report data is discarded.	SYS	0	3	0
Critical (CRT)	46	Hard disk fail	Interaction with the hard disk is no longer possible. No further use of the hard disk is attempted until the system is restarted. The most likely cause is a physical failure of the hard disk drive.	SYS	0	3	Diagnostic code

† The "Class" column provides the initial default setting of the alarm class for each fault code. The alarm class for any particular alarm code is configurable using the ALCLS command and can be viewed using the ALCLP command. Changing the alarm class for an event type changes the Severity indicated by the LEDs and/or relays.

Table 10. Alarm Fault Codes (Continued)

Severity (LED)	CODE	Name	Event Description	CATEGORY	ID	Class †	DIAG
Critical (CRT)	63	PSU failure	The system has detected that one or more power supplies have failed. The system is able to operate with the loss of a single power supply but the power supply must be replaced at the earliest possible opportunity.	SYS	PSU ID	3	0
Critical (CRT)	72	Fan failure	The system has detected a failure of one or more or its cooling fans leading to an inadequate cooling supply. The faulty fan(s) should be replaced immediately.	SYS	0	3	0
Critical (CRT)	76	CPU warning	The system has detected that one or more of the CPUs is likely to fail.	SYS		3	
Critical (CRT)	77	CPU failure	The system has detected that one or more of the CPUs has failed.	SYS		3	
Critical (CRT)	78	Memory failure	The system has detected that one or more of its memory modules has failed.	SYS		3	
Major (MJR)	1	PCM loss	Loss of signal at PCM input port	PCM	PCM	4	0
Major (MJR)	2	AIS	PCM input port contains the Alarm Indication Signal (all ones on all timeslots)	PCM	PCM	4	0
Major (MJR)	3	Frame sync loss	Loss of frame alignment on PCM port	PCM	PCM	4	0
Major (MJR)	4	Frame slip	A frame slip occurred on the PCM port. This alarm event is given for each occurrence of a frame slip.	PCM	PCM	4	0
Major (MJR)	5	Remote alarm	PCM port is receiving a Remote Alarm Indication. This usually indicates that the remote end is either failing to achieve frame alignment or that it is experiencing a high bit error rate on the received signal.	PCM	PCM	4	0
Major (MJR)	6	BER > 1:10^5	The input PCM signal contains a Bit Error Rate (BER) in excess of 1 in 100,000 as measured on the frame alignment pattern. This is usually due to faulty cabling or a faulty PCM board at the remote end.	PCM	PCM	4	0
Major (MJR)	7	BER > 1:10^3	The input PCM signal contains a Bit Error Rate (BER) in excess of 1 in 1000 as measured on the frame alignment pattern. This is usually due to faulty cabling or a faulty PCM board at the remote end.	PCM	PCM	4	0
Major (MJR)	9	C7 link fail	An SS7 signaling link has failed. Usually due to incorrect configuration (signaling timeslot), connectivity fault or inactive signaling terminal at the remote end.	SIG	C7LINK	4	0
Major (MJR)	15	Fan warning	The system has detected either the failure of one of the cooling fans or that a fan is likely to fail. The cooling will remain adequate during this condition but the fan should be replaced at the next convenient opportunity.	SYS	0	4	0
Major (MJR))	17	Alarm Test 2	This event indicates that the user has invoked the alarm test for alarm class 2 using the ALTEI command.	SYS	0	4	0
Major (MJR)	20	Temperature	The internal temperature is outside a preset threshold indicating either an internal fault or failure of the cooling arrangements. Inspection should take place immediately.	SYS	CPU ID	4	0
Major (MJR)	33	Sync failure	None of the PCM ports that have been configured as possible clock sources contain a valid PCM signal. Under these conditions the Signaling Gateway will generate synchronisation using a local oscillator.	PCM	0	4	0

† The “Class” column provides the initial default setting of the alarm class for each fault code. The alarm class for any particular alarm code is configurable using the ALCLS command and can be viewed using the ALCLP command. Changing the alarm class for an event type changes the Severity indicated by the LEDs and/or relays.

Table 10. Alarm Fault Codes (Continued)

Severity (LED)	CODE	Name	Event Description	CATEGORY	ID	Class †	DIAG
Major (MJR)	35	PCM error ind	Diagnostic event relating to the PCM functionality. Persistent events of this type should be reported to your support representative.	NONE		4	
Major (MJR)	36	PCM event ind	Diagnostic information relating to PCMs.	NONE		4	
Major (MJR)	39	System restart req	The user has changed configuration parameters that require the system to be restarted before they can take effect. The alarm will persist until the system is restarted.	SYS	0	4	0
Major (MJR)	40	RDC failure	Failure of communication with a remote data center. Usually due to incorrect configuration (IP address, username or password), connectivity fault or inactive equipment at the remote end.	SIG	RDC	4	0
Major (MJR)	42	RDC err ind	Diagnostic event relating to the transfer of data to an RDC. Persistent events of this type should be reported to your support representative.	NONE		4	
Major (MJR)	44	CR send fail	The Signaling Gateway is unable to transfer information to an RDC for a Continuous Record. Possible problems include: no RDCs available, directory does not exist on RDC for this CR, write failure on RDC. If the problem clears, this alarm will persist until any records saved on the hard disk during the failure have been successfully transferred to an RDC.	NONE	RECORD	4	Diagnostic code
Major (MJR)	45	PR send fail	The Signaling Gateway is unable to transfer information to an RDC for a Periodic Report. Possible problems include: no RDCs available, directory does not exist on RDC for this PR, write failure on RDC. If the problem clears, then the alarm will clear at the next successful transfer of data for the Periodic Report.	NONE	REPORT	4	Diagnostic code
Major (MJR)	47	Hard disk full	The hard disk drive capacity for a Continuous Record has reached its limit. Either there is no more space on the hard disk drive to store data, or this continuous record has the maximum amount of data stored for it on the hard drive. In both cases, records is discarded until an RDC recovers and all stored records are transferred from the Signaling Gateway. The alarm will then clear.		RECORD	4	
Major (MJR)	50	Board cong	A board has reached a congestion threshold. Boards repeatedly entering congestion indicate a need to increase the dimensioning of the switch.	SYS	BPOS	4	
Major (MJR)	53	PCM mismatch	The PCMTYPE setting is inconsistent with the hardware settings on the board.	SYS	PCM	4	0
Major (MJR)	61	Software mismatch	The system has only partially been upgraded and a full software update is required. The system is running in 'safe' mode running limited management software. No circuits have been brought into service.	SYS	0	4	0
Major (MJR)	62	C7 link Cong	A SS7 signaling link is encountering congestion.	SIG	C7LINK	4	0
Major (MJR)	64	Power warning	The system has detected that the voltage on one or more power rails is out of range. This is usually due to either a faulty power supply module or a faulty board causing excessive current consumption.	SYS	0	4	0
Major (MJR)	65	Assoc fail	A SIGTRAN signaling link has failed. Usually due to incorrect configuration (connectivity fault or inactive signaling at the remote end.	SIG	SNLINK	4	0

† The "Class" column provides the initial default setting of the alarm class for each fault code. The alarm class for any particular alarm code is configurable using the ALCLS command and can be viewed using the ALCLP command. Changing the alarm class for an event type changes the Severity indicated by the LEDs and/or relays.

Table 10. Alarm Fault Codes (Continued)

Severity (LED)	CODE	Name	Event Description	CATEGORY	ID	Class †	DIAG
Major (MJR)	66	NIF event ind	Diagnostic event relating to the Nodal Interworking Function. Persistent events of this type should be reported to your support representative.	NONE		4	
Major (MJR)	67	NIF err ind	Diagnostic event relating to the Network Interface Function. Persistent events of this type should be reported to your support representative.	NONE		4	
Major (MJR)	68	SNRT unavail	Reserved	SIG	NC	4	0
Major (MJR)	69	C7RT unavail	One or more SS7 routes are unavailable	SIG	NC	4	0
Major (MJR)	70	RAS unavail	One or more SIGTRAN Application Servers are unavailable	SIG	NC	4	0
Major (MJR)	71	RAS under res	One or more SIGTRAN Application Servers are available but have insufficient number of ASP (load sharing mode only)	SIG	NC	4	0
Major (MJR)	73	M2PA event ind	Diagnostic event relating to the M2PA protocol layer. Persistent events of this type should be reported to your support representative.	NONE		4	
Major (MJR)	74	M2PA err ind	Diagnostic event relating to the M2PA protocol layer. Persistent events of this type should be reported to your support representative.	NONE		4	
Major (MJR)	81	Hard Disk Drive Failure	A RAID 1 hard disk drive is unavailable or out of synchronisation with the other disk of the RAID array	SYS	drive ID		
Minor (MRN)	16	Alarm Test 1	This event indicates that the user has invoked the alarm test for alarm class 1 using the ALTEI command.	SYS	0	5	0
Minor (MRN)	19	System Restart	This event indicates the time at which a system restart occurred.	SYS	0	5	0
Minor (MRN)	34	New sync source	The Signaling Gateway has selected a new PCM as the clock synchronization source.	PCM	PCM	5	
Minor (MRN)	79	Default alarm	The system has detected a low priority low level alarm condition. The user should contact their support contact for further information.	SYS		5	

† The “Class” column provides the initial default setting of the alarm class for each fault code. The alarm class for any particular alarm code is configurable using the ALCLS command and can be viewed using the ALCLP command. Changing the alarm class for an event type changes the Severity indicated by the LEDs and/or relays.

Chapter 9: Remote Data Center Operation

The Remote Data Center (RDC) service allows the transfer of data between the Dialogic® DSI Signaling Gateway and a remote computer located at a remote management center. Data is transferred over a local or wide area network using the ftp protocol.

Up to four different RDCs can be configured and each report can be configured to use two RDC's (one as the primary RDC and the other as the backup RDC). This provides continuity of service in case the connection to the primary RDC fails.

The RDC uses the ftp file transfer mechanism to exchange data with the remote site. The remote site requires only an industry standard ftp server to handle the file transfer and does not require any proprietary software on the remote computer. The Signaling Gateway “logs on” to the remote computer using a user-configured user name and password.

Two categories of report are made to the RDC, Continuous Records and Periodic Reports. In each case, there are several report types as detailed below.

The data transferred for each report type is stored in a different directory on the remote system using a new file for each day's information. The directory name is user configurable.

9.1 Local Data Centers

As the Signaling Gateway can act as an ftp server, the Signaling Gateway itself can act as a “Remote Data Center”' locally storing files and providing RDC services. Configuration in the manner is particularly useful as a backup when loss of communication with normal RDCs occur.

When the unit is configured to store continuous records and periodic reports locally, the user is responsible for the management of the file space used on the Signaling Gateway. If the file system becomes full, the Signaling Gateway is no longer able to back up files locally. A full file system has no other impact on the operation of the Signaling Gateway and the user is able to correct the problem by removing files from within the “siuftp” account.

9.2 Continuous Records

Continuous records provide the capability to transfer records to an RDC on a continuous basis in near real time. The minimum number of records collected prior to transfer and the maximum time interval before the transfer is attempted are configured by the user. This allows the user complete control over when records are transferred to the remote data center, within system limits.

Continuous recording can be configured to support the occurrence and clearing of alarms to an RDC. The records are formatted as a comma separated variable (CSV) text file.

9.3 Periodic Reporting

Periodic reports can be configured to support the transfer to an RDC of data at user-defined intervals, typically allowing, for example, hourly reports of traffic measurements on a per SS7 link basis. The reports are formatted as a CSV file.

9.3.1 C7 Link Traffic Measurements

Measurements collected on a per CCS SS7 signaling basis can be transferred periodically to the RDC. These measurements can optionally be reset at the expiry of each interval.

9.3.2 PCM Traffic Measurements

Measurements collected on a per PCM basis can be transferred periodically to the RDC. These measurements can optionally be reset at the expiry of each interval.

9.3.3 SIGTRAN Link Traffic Measurements

Measurements collected on a per SIGTRAN link basis can be transferred periodically to the RDC. These measurements can optionally be reset at the expiry of each interval.

9.3.4 Ethernet Port Traffic Measurements

Measurements collected on performance data associated with Ethernet ports can be transferred periodically to the RDC. These measurements can optionally be reset at the expiry of each interval.

9.3.5 System Measurements

Measurements collected on system performance data can be transferred periodically to the RDC. These measurements can optionally be reset at the expiry of each interval.

9.4 RDC File Formats

This section specifies the file formats for records that are sent from the Signaling Gateway to a Remote Data Center (RDC). As shown in the examples, the records are provided in CSV (Comma Separated Variable) text file format.

9.4.1 Alarm Record File Format

```
10,11,1,0,3,A,2001-01-01,00:00:35,,,Linkset fail
11,9,1,0,2,A, 2001-01-01,00:00:35,,,C7 link fail
2,44,1,3,2,C, 2001-01-01,00:00:28, 2001-01-01,00:00:36,CR send fail
11,9,1,0,2,C, 2001-01-01,00:00:35, 2001-01-01,00:00:36,C7 link fail
10,11,1,0,3,C, 2001-01-01,00:00:35, 2001-01-01,00:00:36,Linkset fail
```

Field	Title	Example	Range	Description
1	ALP	10	1 to 9999	Sequence reference number of an entry in the alarm log
2	CODE	11	1 to 999	Fault code of a system alarm
3	ID	1	0 to 9999	Identifier for alarm (usage depends on the alarm code)
4	DIAG	0	0 to 9999	Diagnostic of the alarm (usage depends on the alarm code)
5	CLA	3	3,4,5	Alarm class number
6	ACTIVE	C	A or C	Indication whether the alarm is Active or Cleared
7	DATE OCCURRED	1970-01-01	yyyy-mm-dd	Date the alarm occurred
8	TIME OCCURED	00:00:35	hh:mm:ss	Time the alarm occurred
9	DATE CLEARED	1970-01-01	yyyy-mm-dd	Date the alarm cleared
10	TIME CLEARED	00:00:36	hh:mm:ss	Time the alarm cleared
11	TITLE	Linkset fail	Up to 12 text characters	Title of the alarm

9.4.2 Ethernet Port Measurements File Format

```
2005-11-16,14:40:01,1,265,2016,0,0,0,0,0,0,119,1136,0,0,0,0,0,0,2077
2005-11-16,14:40:01,4,4664602,3448084,0,0,0,0,0,0,1183455,1809415,0,0,0,0,0,0,2077
2005-11-16,14:45:01,1,301,2368,0,0,0,0,0,0,145,1379,0,0,0,0,0,0,2377
2005-11-16,14:45:01,4,10220775,7212808,0,0,0,0,0,0,1270164,3077831,0,0,0,0,0,0,2377
```

Field	Field	Example	Range	Description
1	Date	2005-11-16	yyyy-mm-dd	Date when measurements collected
2	Time	14:40:01	hh:mm:ss	Time when measurements collected
3	ETH	1	1 to 4	Ethernet port number
4	RXKBYTE	10220775	0 to 4294967295	Number of kilobytes of data received (in kilobytes)
5	RXPKT	7212808	0 to 4294967295	Number of packets of data received
6	RXERR	0	0 to 4294967295	Number of receive errors detected
7	RXDROP	0	0 to 4294967295	Number of received packets dropped by the device driver
8	RXFIFO	0	0 to 4294967295	The number of FIFO buffer errors received
9	RXFRAME	0	0 to 4294967295	The number of packet framing errors received
10	RXCOMP	0	0 to 4294967295	The number of compressed packets received
11	RXMULT	0	0 to 4294967295	The number of multicast frames received
12	TXKBYTE	1270164	0 to 4294967295	Number of kilobytes of data transmitted (in kilobytes)
13	TXPKT	3077831	0 to 4294967295	Number of packets of data transmitted

9.4.3 PCM Measurements File Format

```
2001-12-31,13:07:25,600,1-1,5,50,20,500
2001-01-01,01:01:00,86400,1-2,90,1000,1000,1000
2001-11-22,19:07:38,3600,2-1,1,0,0,0
```

Field	Title	Example	Range	Description
1	Date	2001-12-31	yyyy-mm-dd	Date when measurements collected
2	Time	13:07:25	hh:mm:ss	Time when measurements collected
3	Period	600	0:4294967295	Duration of measurement period in seconds
4	PCM	3-1	x: 1 to 3 y: 1 to 4	PCM: x-y board id – port id.
5	Frame Slip counter	50	0 to 4294967295	Number of frame slips occurred.
6	Out of synchronism transitions	1000	0 to 4294967295	Number of out-sync transitions.
7	Errored Seconds counter	20	0 to 4294967295	Number of Errored Seconds occurred.
8	Severely Errored Seconds counter	500	0 to 4294967295	Number of Severely Errored Seconds.

9.4.4 SS7 Link Measurements File Format

```
2001-12-31,13:07:25,600,3,1000,56,513,502,20,6512,6502,10
2001-01-01,01:01:00,86400,2,5000,10,1000,1000,10,1000,1000,0
2001-11-22,19:07:38,3600,1,0,0,0,0,0,0,0,0
```

Field	Title	Example	Range	Description
1	Date	2001-12-31	yyyy-mm-dd	Date when measurements collected
2	Time	13:07:25	hh:mm:ss	Time when measurements collected
3	Period	600	0 to 4294967295	Duration of measurement period in seconds
4	SS7 Link	3	0 to 32	SS7 Link Number.
5	In Service	1000	0 to 4294967295	Duration of the link IN-SERVICE state.
6	Negative ACK	56	0 to 4294967295	Number of negative acknowledgement received. **NOTE:** Not applicable for M2PA SS7 links and is set to 0. See SIGTRAN Link measurements.
7	Octects Transmitted	513	0 to 4294967295	Number of octetcs transmitted.
8	Octects Received	502	0 to 4294967295	Number of octetcs received.
9	Octets Retransmitted	20	0 to 4294967295	Number of octetcs retransmitted. **NOTE:** Not applicable for M2PA SS7 links and is set to 0. See SIGTRAN Link measurements.
10	MSU Transmitted	6512	0 to 4294967295	Number of MSU transmitted.
11	MSU Received	6502	0 to 4294967295	Number of MSU received.
12	Congestion Counter	10	0 to 4294967295	Number of congestion events occurred.

9.4.5 SIGTRAN Link Measurements File Format

```
2001-12-31,13:07:25,600,2,886,888,5,0,0
2001-01-01,01:01:00,86400,5,5000,6000,1000,1000,65
2001-11-22,19:07:38,3600,1,0,0,0,0,0
```

Field	Title	Example	Range	Description
1	Date	2001-12-31	yyyy-mm-dd	Date when measurements collected
2	Time	13:07:25	hh:mm:ss	Time when measurements collected
3	Period	600	0 to 4294967295	Duration of measurement period in seconds
4	SIGTRAN Link	2	0 to 32	SIGTRAN Link Number.
5	Chunks Received	886	0 to 4294967295	Number of chunks received in the link.
6	Chunks Transmitted	888	0 to 4294967295	Number of chunks transmitted in the link.
7	Chunks Retransmitted	5	0 to 4294967295	Number of chunks retransmitted in the link.
8	Number of times out of service.	0	0 to 4294967295	Duration in abort and shutdown states.
9	Out of service duration.	0	0 to 4294967295	Duration of the link out of service since last reset.

9.4.6 System Measurements File Format

```
2005-11-16,14:40:01,0,231,155,8462
2005-11-16,14:45:01,0,368,159,8762
2005-11-16,14:50:01,0,380,164,9062
```

Field	Field	Example	Range	Description
1	Date	2005-11-16	yyyy-mm-dd	Date when measurements collected
2	Time	14:40:01	hh:mm:ss	Time when measurements collected
3	NOVLD	0	0 to 65535	The number of periods of congestion (overload) during the measurement period
4	MAXLOAD	380 (3.8%)	0 to 10000	Maximum load average measurement taken over 1 minute (based on the UNIX load average) multiplied by 100
5	LOADAVG	164 (1.64%)	0 to 10000	The average load on the system (based on the UNIX load average) measurement taken over the measurement period multiplied by 100
6	PERIOD	9062	0 to 4294967295	Duration of measurement period in seconds

9.5 RDC Configuration and Usage

This section provides a guide to the configuration of the Signaling Gateway for RDC operation, the text demonstrates by example, the man machine language (MML) commands and parameters required to invoke those services that transfer data to and from the RDC.

9.5.1 RDC Initialization

Initialize the RDC using the CNRDI command:

```
CNRDI:RDC=1,IPADDR=123.123.123.12,USER=ANONYMOUS,PASSWORD=ANONYMOUS,     LABEL=MYWORKSTN;
```

Unblock the RDC using the MNBLE command:

```
MNBLE:RDC=1;
```

Check the status of the RDC with the STRDP command:

```
STRDP;
```

9.5.2 Continuous Records

Continuous records, once created, are automatically transferred to the hard drive of the RDC. The user can configure the transfer interval ranging from 30 seconds to 24 hours. A different directory should be specified for each record type.

A file is created on the RDC during the first transfer for each record type during any 24 hour period beginning at midnight. Filenames are unique, identifying the date of transfer in the form YYYYMMDD.

Alarm Data

As alarms are generated, they are stored in the alarm logs on the converter. A record of these alarms can also be transferred to an RDC.

The following examples describe how a continuous record of type ALARM is initialized:

```
RDCRI:RECORD=3,CRTYPE=ALARM,PERIOD=00:30:00,MINREC=100,RDC1=1,
      LABEL=ALARMS;
```

The RDCRI command creates record number 3 that is of type ALARM. The contents of the record is transferred to the RDC when either the period or minrec, (minimum number of records), conditions are met.

RDC number 1 is the primary RDC; no secondary RDC has been identified. Records are transferred to the ALARMS directory on the RDC.

9.5.3 Periodic Reports

Periodic reports, once created, are periodically transferred to the RDC. The user can configure the transfer interval ranging from five minutes to 24 hours. Each report type should be collected in a different directory.

A file is created on the RDC during the first transfer for each report type during any 24 hour period beginning at midnight. Filenames are unique, identifying the date of transfer in the form YYYYMMDD.

Periodic report data can optionally be reset, (all values to zero), following each file transfer.

SS7 Signaling Link Traffic Measurements

Traffic measurement data can be generated for each SS7 signaling link.

The following examples describe how a periodic report is first created before SS7 Links (C7LINK) are selected as the collection points:

```
RDPRI:REPORT=1,PRTYPE=MSC7,PERIOD=01:00:00,RDC1=4,
      RESET=Y,LABEL=C7LINK;
```

The RDPRI command creates report number 1 that is of type MSC7. The contents of the report is transferred to the RDC once each period.

RDC number 4 is the primary RDC; no secondary RDC is identified in the example. Reports are transferred to the C7LINK directory on the RDC. Because the RESET parameter has been set to 'Y', data for each SS7 link associated with this report is reset following each file transfer.

Once the periodic report has been initialized, existing SS7 links can be dynamically associated with it using the RDPDI command or removed with the RDPDE command, for example:

```
RDPDI:REPORT=1,C7LINK=2&3;
RDPDE:REPORT=1,C7LINK=3;
```

The RDPDI command identifies SS7 links 2 and 3 as collection points for report 1. The RDPDE command removes SS7 link 3 from the report.

PCM Traffic Measurements

Periodic reports conveying PCM performance data can be configured using the RDPRI command. PCMs are associated with the report using the RDPDI command. PCMs can be removed from the report using the RDPDE command.

The PRTYPE parameter should be **MSPCM**.

SIGTRAN Link Traffic Measurements

Periodic reports conveying SIGTRAN link performance data can be configured using the RDPRI command. SIGTRAN Links (SNLINK) are associated with the report using the RDPDI command. SIGTRAN Links can be removed from the report using the RDPDE command.

The PRTYPE parameter should be **MSSL**.

Ethernet Port Traffic Measurements

Periodic reports conveying Ethernet performance data can be configured using the RDPRI command. ETH ports are associated with the report using the RDPDI command. ETH ports can be removed from the report using the RDPDE command.

The PRTYPE parameter should be **MSEP**.

System Measurements

Periodic reports conveying system performance data can be configured using the RDPRI command. There are no associated data types for use with this command.

The PRTYPE parameter should be **MSSY**.

9.5.4 Software Update

See Section 4.11.1, “Software Update from a Remote Data Center” on page 32 for example MML that upgrades the Signaling Gateway software from an RDC.

9.5.5 Configuration Backup

See Section 4.12.1, “Configuration Backup to Remote Data Center” on page 33 for example MML that upgrades the Signaling Gateway configuration from an RDC.

9.5.6 Configuration Update

See Section 4.13.1, “Configuration Update from a Remote Data Center” on page 33 for example MML that upgrades the Signaling Gateway configuration from an RDC.

9.5.7 Software Option Installation

See Section 3.2.5, “License Update from Remote Data Center” on page 25 for example MML that installs software options onto the Signaling Gateway from an RDC.

Chapter 10: Signaling Server SNMP

10.1 Overview

The Signaling Server supports two distinct SNMP offerings:

- A basic offering supporting a simple SNMP MIB: DK4032 SNMP. (See Section 10.1.2)
- An extended SNMP offering comprehensive support for status and traps, Distributed Structure Management Information (DSMI) SNMP. On SS7G21 and SS7G22 systems DSMI SNMP requires the purchase of the SS7SBG20SNMP software license. On the SS7G31 and SS7G32 systems the DSMI SNMP license is included with the purchased SGW license. (See Section 10.1.1.)

SNMP operation is disabled by default.

Activating SNMP

SNMP support can be activated for:

- Basic SNMP, by setting the CNSNS MMI command's SNMP parameter to **DK4032**.
- Extended SNMP operation (if licensed) by setting the CNSNS MMI command's SNMP parameter to **DSMI**.

The server should be restarted using the MNRSI command to activate the SNMP agent.

10.1.1 DSMI SNMP

DSMI SNMP functionality allows the configuration of V1 (RFC 1157), V2c (RFC 1901) or V3 (RFC 2571) SNMP traps notifying external SNMP managers of alarm conditions and configuration state changes for the objects supported on the MIB.

For all objects represented within the DSMI MIB — and these include platform hardware components as well as configuration aspects — the MIB will maintain current object state and alarm conditions affecting the object.

SNMP traps can be configured on a per-object basis such that the remote SNMP manager is notified whenever the object is created, destroyed or the object state changed. Traps can also be configured to notify the manager of all events affecting the object. SNMP traps identify the event affecting the object — be it an alarm indication or configuration state change — and an event severity level.

For details of the DSMI SNMP MIB, supported alarms, SNMP traps and configuration refer to the *Dialogic® DSI Signaling Servers SNMP User Manual. (U05EPP01)*.

10.1.2 DK4032 SNMP

DK4032 SNMP supports an SNMP version 1 managed agent to allow a remote management platform to interrogate the current alarm status of the Signaling Server. Variables are supported from the MIB II system branch and from an enterprise MIB. The MIB provides read-only access to all variables.

The MIB II system branch provides basic information about managed node, that is, the Signaling Server. The Enterprise-specific branch of the MIB provides information as to the number of outstanding alarms, grouped by Category and Class (see Chapter 8, “Alarm Fault Code Listing”).

You should then use your SNMP manager to communicate with Signaling Server, using the SNMP UDP port 161.

The MIB is shown in full below:

```
-- ------------------------------------------------------------------ --
-- ------------------------------------------------------------------ --
--                                                                    --
--                         The DataKinetics 4032 MIB                  --
--                                                                    --
-- ------------------------------------------------------------------ --
-- ------------------------------------------------------------------ --
--
--  Management Information Base for SNMP Network Management on DataKinetics
--  products.
--
--   Copyright 1999-2008, Dialogic Corporation. All Rights Reserved.
--
--   The information in this document is subject to change without notice.
--
--   Enterprise number is 4032.
--
-- ------  ----------  ---- ------------------------------------------ --
-- Issue      Date      By    Changes                                   --
-- ------  ----------  ---- ------------------------------------------ --
-- 2          08-Jul-02 GNK - First published release
-- 3          26-Mar-08 EWT - Alarm classes change to ITU values
-- ------  ----------  ---- ------------------------------------------ --

DK-GLOBAL-REG DEFINITIONS ::= BEGIN

    IMPORTS
        enterprises             FROM RFC1155-SMI
        OBJECT-TYPE             FROM RFC1155-SMI;
--
-- The DataKinetics enterprise node
--
    datakinetics           OBJECT IDENTIFIER ::= { enterprises 4032 }

-- ------------------------------------------------------------------------
-- The MIB version stands alone at the top level
--
    dkMibVer OBJECT-TYPE
       SYNTAX  INTEGER
       ACCESS  read-only
       STATUS  mandatory
       DESCRIPTION
           "The current version of the MIB running on the agent. Currently
            the following values are recognised

            0 - Pre-release
            1 - Pre-release
            2 - First published release"

       ::= { datakinetics 1 }

-- ------------------------------------------------------------------------
-- ------------------------------------------------------------------------
-- Top level nodes within DK4032 MIB.
--
    dkSysInfo              OBJECT IDENTIFIER ::= { datakinetics 2 }

-- ------------------------------------------------------------------------
-- ------------------------------------------------------------------------
-- The system information branch
--

    dkSysAlarms          OBJECT IDENTIFIER ::= { dkSysInfo 4 }

-- ------------------------------------------------------------------------
-- The Alarms branch
--
    dkAlrmCategory          OBJECT IDENTIFIER ::= { dkSysAlarms 1 }

    dkAlrmPcm OBJECT-TYPE
       SYNTAX  INTEGER
       ACCESS  read-only
       STATUS  mandatory
       DESCRIPTION
           "The number of active PCM alarms"
```

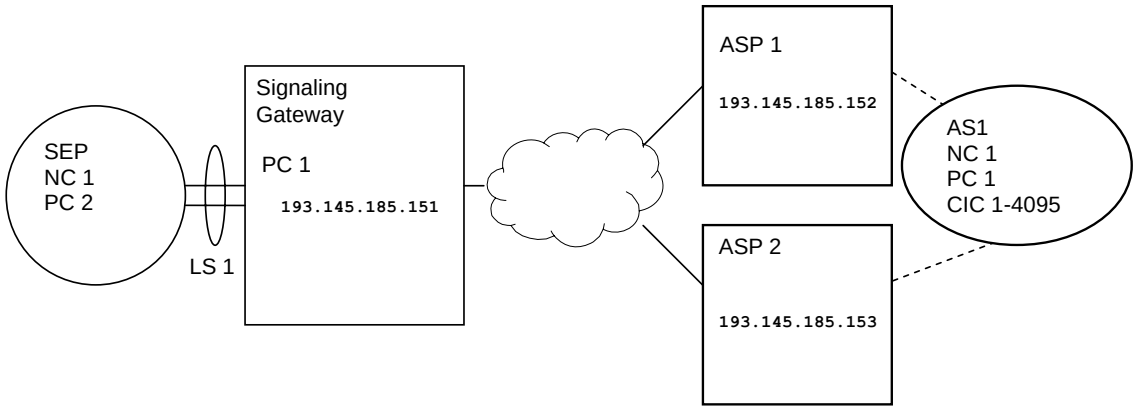
```
        ::= { dkAlrmCategory 1 }

    dkAlrmSig OBJECT-TYPE
       SYNTAX  INTEGER
       ACCESS  read-only
       STATUS  mandatory
       DESCRIPTION
           "The number of active signalling alarms"
       ::= { dkAlrmCategory 2 }

    dkAlrmSys OBJECT-TYPE
       SYNTAX  INTEGER
       ACCESS  read-only
       STATUS  mandatory
       DESCRIPTION
           "The number of active system alarms"
       ::= { dkAlrmCategory 3 }

    dkAlrmClass             OBJECT IDENTIFIER ::= { dkSysAlarms 2 }

    dkClass1 OBJECT-TYPE
       SYNTAX  INTEGER
       ACCESS  read-only
       STATUS  mandatory
       DESCRIPTION
           "The number of active Class 5 alarms"
       ::= { dkAlrmClass 1 }

    dkClass2 OBJECT-TYPE
       SYNTAX  INTEGER
       ACCESS  read-only
       STATUS  mandatory
       DESCRIPTION
           "The number of active Class 4 alarms"
       ::= { dkAlrmClass 2 }

    dkClass3 OBJECT-TYPE
       SYNTAX  INTEGER
       ACCESS  read-only
       STATUS  mandatory
       DESCRIPTION
           "The number of active Class 3 alarms"
       ::= { dkAlrmClass 3 }

END

-- ------------------------------------------------------------------------
-- ------------------------------------------------------------------------
```

Chapter 11: Worked Configuration Examples

11.1 Backhaul Configuration

The following is an example of a Signaling Gateway working in a “backhaul” configuration. The Signaling Gateway is connected to a single Signaling End Point (SEP) on the TDM side. On the IP side there is a single Remote Application Server (RAS) that processes circuit-related messages. The RAS exists on two ASPs for resilience. On the SS7 side, boards 2 and 3 are used to terminate two SS7 E1 PCMs. Each PCM carries 1 timeslot with SS7 signaling. The Point Code of the gateway equipment is 1, which is the same as that of the application server.

Figure 12. Example Back-Haul Configuration



The set of commands required to configure the system is as follows:

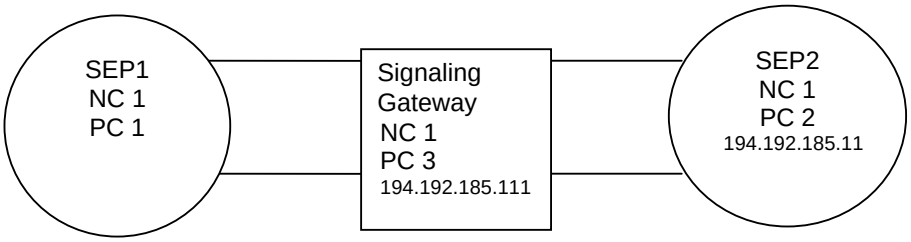
```
CNSYS:SYSID=THISSITE,IPADDR=193.145.185.151;
MNRSI;
CNBOI:BPOS=2,BRDTYPE=SPCI2S-4-2,SIGTYPE=SS7;
CNBOI:BPOS=3,BRDTYPE=SPCI2S-4-2,SIGTYPE=SS7;
CNPCI:PCM=2-3,PCMTYPE=E1,SYNCPRI=1;
CNPCI:PCM=3-3,PCMTYPE=E1,SYNCPRI=1;
C7LSI:LS=1,OPC=1,DPC=2,LSSIZE=2,SS7MD=ITU14,NC=1,NI=2;
C7SLI:C7LINK=1,EQU=2-1,TS=2-3-16,LS=1,SLC=0;
C7SLI:C7LINK=2,EQU=3-1,TS=3-3-16,LS=1,SLC=1;
C7RTI:C7RT=1,NC=1,DPC=2,LS1=1;
SNSLI:SNLINK=1,SNTYPE=SGM3UA,END=S,SS7MD=ITU14,NC=1,
      IPADDR=193.145.185.152,LABEL=ASP1;
SNSLI:SNLINK=2,SNTYPE=SGM3UA,END=S,SS7MD=ITU14,NC=1,
       IPADDR=193.145.185.153,LABEL=ASP2;
SNRAI:RAS=1,NC=1,DPC=1,RC=1,LABEL=AS1;
SNALI:RAS=1,SEQ=1,SNLINK=1;
SNALI:RAS=1,SEQ=2,SNLINK=2;
SGDPI:DEST=1,RAS=1,RTPRI=NONE,LABEL=AS1;
SGDPI:DEST=2,RTPRI=MTP,LABEL=TDM_SEP;
SGRKI:RKI=1,RKTAB=1,NC=1,DPC=1,BCIC=1,RANGE=4095,DEST=1;
SGRKI:RKI=2,RKTAB=1,NC=1,DPC=2,DEST=2;
SGIRI:IR=1,RKTAB=1,NC=1,DOMAIN=MTP;
SGIRI:IR=2,RKTAB=1,NC=1,DOMAIN=IP;
MNBLE:BPOS=2&&3;
MNBLE:SNLINK=1&&2;
MNBLE:C7LINK=1&&2;
MNBLE:RAS=1;
```

11.2 M2PA Longhaul Configuration

The following is an example of a Signaling Gateway offering the longhaul of SS7 signaling over M2PA. The Signaling Gateway is connected to a Signaling End Point (SEP) on the TDM side and an SEP on the IP side. Each SEP treats the Signaling Gateway as an STP to reach its destination SEP. On the TDM side, board 1 is used to terminate two SS7 E1 PCMs with clock being taken from SEP 1. Each PCM carries 1 timeslot with SS7 signaling to SEP 1. On the SIGTRAN IP side, two M2PA associations are used to convey two SS7 signaling links to SEP 2. The Point Code of the gateway equipment is 3; the SEPs are Point Codes 1 and 2 respectively.

Note: Potentially, routing keys are not required in this scenario, in that you could simply configure a the incoming route to go directly to the TDM destination. Routing keys are present since they allow the Signaling Gateway to validate the DPC in the received data message.

Figure 13. M2PA Longhaul Configuration

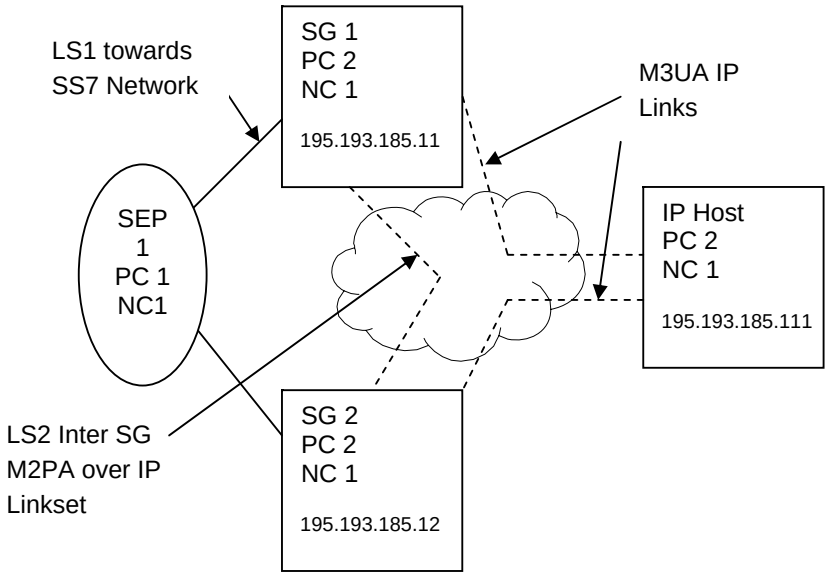


The set of commands required to configure the system is as follows:

```
CNSYS:SYSID=SGW1,IPADDR=194.192.185.111;
MNRSI;
CNBOI:BPOS=1,BRDTYPE=SPCI2S-4-2,SIGTYPE=SS7;
CNBOI:BPOS=2,BRDTYPE=SPCI2S-4-2,SIGTYPE=SS7;
CNPCI:PCM=1-3,PCMTYPE=E1,SYNCPRI=1;
CNPCI:PCM=2-3,PCMTYPE=E1,SYNCPRI=1;
SNSLI:SNLINK=1,SNTYPE=M2PA,END=C,IPADDR=194.192.185.11,      HPORT=3565,PPORT=3565,LABEL=SEP2-1;
SNSLI:SNLINK=2,SNTYPE=M2PA,END=C,IPADDR=194.192.185.11, HPORT=3566,PPORT=3566,LABEL=SEP2-2;
C7LSI:LS=1,OPC=3,DPC=1,LSSIZE=2,SS7MD=ITU14,NC=1,NI=2;
C7LSI:LS=2,OPC=3,DPC=2,LSSIZE=2,SS7MD=ITU14,NC=1,NI=2;
C7SLI:C7LINK=1,EQU=1-1,TS=1-3-16,LS=1,SLC=0;
C7SLI:C7LINK=2,EQU=2-1,TS=2-3-16,LS=1,SLC=1;
C7SLI:C7LINK=3,SNLINK=1,LS=2,SLC=0;
C7SLI:C7LINK=4,SNLINK=2,LS=2,SLC=1;
C7RTI:C7RT=1,NC=1,DPC=1,LS1=1;
C7RTI:C7RT=2,NC=1,DPC=2,LS1=2;
SGDPI:DEST=1,RTPRI=MTP,LABEL=SEP1-2;
SGRKI:RKI=1,RKTAB=1,NC=1,DPC=1,DEST=1;
SGRKI:RKI=2,RKTAB=1,NC=1,DPC=2,DEST=1;
SGIRI:IR=1,NC=1,RKTAB=1;
MNBLE:BPOS=1&2;
MNBLE:SNLINK=1&2;
MNBLE:C7LINK=1&&4;
```

11.3 Dual Resilient Configuration

Figure 14. Example Dual Resilient Configuration



The following configuration commands are for SG1 and SG2, where SG1 and SG2 are in DUAL operation and SG1, SG2 and the IP host are acting as a single Point Code. Note the configuration of LS2 between the two SGs and the use of this link set for routes to the SS7 network.

Note: While this example shows a linkset with M2PA SS7 links over IP between the two Signaling Gateways, the linkset could equally contain SS7 links utilizing timeslots on a PCM between the two Signaling Gateways.

11.3.1 SG 1 Configuration

```
CNSYS:SYSID=SS7G2x 1,IPADDR=194.192.185.11;
CNBOI:BPOS=1,BRDTYPE=SPCI2S-4-2,SIGTYPE=SS7;
CNPCI:PCM=1-3,PCMTYPE=E1,SYNCPRI=1;
C7LSI:LS=1,OPC=2,DPC=1,LSSIZE=2,SS7MD=ITU14,NC=1,NI=2;
C7LSI:LS=2,OPC=2,DPC=2,LSSIZE=2,SS7MD=ITU14,NC=1,NI=2;
C7RTI:C7RT=1,DPC=1,LS1=1,LS2=2;
C7RTI:C7RT=2,DPC=2,LS1=2;
SNSLI:SNLINK=1,SNTYPE=M2PA,END=C,IPADDR=194.192.185.12,
LABEL=INTER-SG;
C7SLI:C7LINK=1,EQU=1-1,TS=1-3-16,LS=1,SLC=0;
C7SLI:C7LINK=2,SNLINK=1,LS=2,SLC=0;

SNSLI:SNLINK=2,SNTYPE=SGM3UA,END=S,SS7MD=ITU14,NC=1,
IPADDR=194.192.185.111,LABEL=IP Host;
SNRAI:RAS=1,NC=1,DPC=2,RC=1,LABEL=IP Host;
SNALI:RAS=1,SEQ=1,SNLINK=2;
SGDPI:DEST=1,AS=1,LABEL=IP Host;
SGDPI:DEST=2,RTPRI=MTP,LABEL=SS7 Net;
SGRKI:RKI=1,RKTAB=1,NC=1,DPC=2,DEST=1;
SGRKI:RKI=2,RKTAB=1,NC=1,DPC=1,DEST=2;
SGIRI:IR=1,RKTAB=1,NC=1;
MNBLE:BPOS=1;
MNBLE:SNLINK=1&2;
MNBLE:C7LINK=1&&2;
MNBLE:RAS=1;
```

11.3.2 SG 2 Configuration

```
CNSYS:SYSID=SS7G2x 2,IPADDR=194.192.185.12;
CNBOI:BPOS=1,BRDTYPE=SPCI2S-4-2,SIGTYPE=SS7;
CNPCI:PCM=1-3,PCMTYPE=E1,SYNCPRI=1;
C7LSI:LS=1,OPC=2,DPC=1,LSSIZE=2,SS7MD=ITU14,NC=1,NI=2;
C7LSI:LS=2,OPC=2,DPC=2,LSSIZE=2,SS7MD=ITU14,NC=1,NI=2;
C7RTI:C7RT=1,DPC=1,LS1=1,LS2=2;
C7RTI:C7RT=2,DPC=2,LS1=2;
SNSLI:SNLINK=1,SNTYPE=M2PA,END=C,IPADDR=194.192.185.11,
LABEL=INTER-SG;
C7SLI:C7LINK=1,EQU=1-1,TS=1-3-16,LS=1,SLC=0;
C7SLI:C7LINK=2,SNLINK=1,LS=2,SLC=0;
SNSLI:SNLINK=2,SNTYPE=SGM3UA,END=S,SS7MD=ITU14,NC=1,
IPADDR=194.192.185.111,LABEL=IP Host;
SNRAI:RAS=1,NC=1,DPC=2,RC=1,LABEL=IP Host;
SNALI:RAS=1,SEQ=1,SNLINK=2;
SGDPI:DEST=1,RAS=1,LABEL=IP Host;
SGDPI:DEST=2,RTPRI=MTP,LABEL=SS7 Net;
SGRKI:RKI=1,RKTAB=1,NC=1,DPC=2,DEST=1;
SGRKI:RKI=2,RKTAB=1,NC=1,DPC=1,DEST=2;
SGIRI:IR=1,RKTAB=1,NC=1;
MNBLE:BPOS=1;
MNBLE:SNLINK=1&2;
MNBLE:C7LINK=1&&2;
MNBLE:RAS=1;
```

Chapter 12: Network Time Protocol

The Network Time Protocol, NTP, allows synchronization of the internal system clock with an external time source thus providing greater accuracy for system alarm events and SNMP trap notifications.

NTP can be activated using the CNTDS (set time and date) command, while up to 16 remote NTP servers can be configured using the CNTPI command. The current status of the NTP servers can be identified using the STTPP command.

Chapter 13: Command Summary

Alarm Commands

- ALCLS - Alarm Class Set
- ALCLP - Alarm Class Print
- ALFCP - Alarm Fault Code Print
- ALLIP - Alarm List Print
- ALLOP - Alarm Log Print
- ALREI - Alarm Reset Initiate
- ALTEI - Alarm Test Initiate
- ALTEE - Alarm Test End

Configuration Commands

- CNBOI - Configuration Board Initiate
- CNBOE - Configuration Board End
- CNBOP - Configuration Board Print
- CNBUI - Configuration Back Up Initiate
- CNMOI - Configuration Monitor Initiate
- CNMOE - Configuration Monitor End
- CNMOP - Configuration Monitor Print
- CNOBP - Display TRAP Configuration
- CNOBS - Set TRAP Configuration
- CNPCI - Configuration PCM Initiate
- CNPCC - Configuration PCM Change
- CNPCE - Configuration PCM End
- CNPCP - Configuration PCM Print
- CNRDI - Configuration Remote Data Center Initiate
- CNRDC - Configuration Remote Data Center Change
- CNRDE - Configuration Remote Data Center End
- CNRDP - Configuration Remote Data Center Print
- CNSMC - Change SNMP Manager Configuration
- CNSME - End SNMP Manager Configuration
- CNSMI - Set SNMP Manager Configuration
- CNSMP - Display SNMP Manager Configuration
- CNSNS - Configuration SNMP Set
- CNSNP - Configuration SNMP Print
- CNSWP - Configuration Software Print
- CNSYS - Configuration System Set
- CNSYP - Configuration System Print
- CNTDS - Configuration Time and Date Set
- CNTDP - Configuration Time And Date Print
- CNTOS - Configuration Timeout Value Set
- CNTOP - Configuration Timeout Value Print
- CNTPE - Configuration Network Time Protocol Server End
- CNTPI - Configuration Network Time Protocol Server Initiate

- CNTPP - Configuration Network Time Protocol Print
- CNTSP - Configuration Timeslot Print
- CNUPI - Configuration Update Initiate
- CNUSC - Change SNMP v3 User Configuration
- CNUSE - End SNMP v3
- CNUSI - Set SNMP v3
- CNUSP - Display SNMP v3
- CNXCI - Configuration Cross Connect Initiate
- CNXCE - Configuration Cross Connect End
- CNXCP - Configuration Cross Connect Print

CCS SS7 Signaling Commands

- C7LSI - CCS SS7 Link Set Initiate
- C7LSC - CCS SS7 Link Set Change
- C7LSE - CCS SS7 Link Set End
- C7LSP - CCS SS7 Link Set Print
- C7RTI - CCS SS7 Route Initiate
- C7RTC - CCS SS7 Route Change
- C7RTE - CCS SS7 Route End
- C7RTP - CCS SS7 Route Print
- C7SLI - CCS SS7 Signaling Link Initiate
- C7SLC - CCS SS7 Signaling Link Change
- C7SLE - CCS SS7 Signaling Link End
- C7SLP - CCS SS7 Signaling Link Print

IP Commands

- IPEPS - Set Ethernet Port Configuration
- IPEPP - Display Ethernet Port Configuration
- IPGWI - Internet Protocol Gateway Initiate
- IPGWE - Internet Protocol Gateway End
- IPGWP - Internet Protocol Gateway Print

MML Commands

- MMLOI - MML Log Off Initiate
- MMLOP - MML Log Off Print
- MMLOS - MML Log Off Set
- MMPTC - MML Port Change
- MMPTP - MML Port Print

Maintenance Commands

- MNBLI - Maintenance Blocking Initiate
- MNBLE - Maintenance Blocking End
- MNINI - Maintenance Inhibit Initiate
- MNINE - Maintenance Inhibit End
- MNRSI - Maintenance Restart System Initiate

Measurement Commands

- MSC7P - Measurements SS7 Print
- MSEPP - Measurement Ethernet Port Print
- MSLCP - Measurement of License Capability Print
- MSPCP - Measurements PCM Print
- MSSLP - Measurements SIGTRAN Link Print
- MSSYP - Measurements System Print

Remote Data Center Commands

- RDCRI - Remote Data Center Continuous Record Initiate
- RDCRC - Remote Data Center Continuous Record Change
- RDCRE - Remote Data Center Continuous Record End
- RDCRP - Remote Data Center Continuous Record Print
- RDPDI - Remote Data Center Periodic Data Initiate
- RDPDE - Remote Data Center Periodic Data End
- RDPDP - Remote Data Center Periodic Data Print
- RDPRI - Remote Data Center Periodic Report Initiate
- RDPRC - Remote Data Center Periodic Report Change
- RDPRE - Remote Data Center Periodic Report End
- RDPRP - Remote Data Center Periodic Report Print

Signaling Gateway Commands

- SGDPI - Signaling Gateway Destination Point Initiate
- SGDPC - Signaling Gateway Destination Point Change
- SGDPE - Signaling Gateway Destination Point End
- SGDPP - Signaling Gateway Destination Point Print
- SGIRI - Signaling Gateway Incoming Route Initiate
- SGIRC - Signaling Gateway Incoming Route Change
- SGIRE - Signaling Gateway Incoming Route End
- SGIRP - Signaling Gateway Incoming Route Print
- SGRKI - Signaling Gateway Routing Key Initiate
- SGRKE - Signaling Gateway Routing Key End
- SGRKP - Signaling Gateway Routing Key Print

SIGTRAN Commands

- SNALI - SIGTRAN Application Server List Initiate
- SNALE - SIGTRAN Application Server List End
- SNALP - SIGTRAN Application Server List Print
- SNRAI - SIGTRAN Remote Application Server Initiate
- SNRAE - SIGTRAN Remote Application Server End
- SNRAP - SIGTRAN Remote Application Server Print
- SNNAI - SIGTRAN Network Appearance Initiate
- SNNAE - SIGTRAN Network Appearance End
- SNNAP - SIGTRAN Network Appearance Print
- SNSLI - SIGTRAN Signaling Link Initiate
- SNSLC - SIGTRAN Signaling Link Change

- SNSLE - SIGTRAN Signaling Link End
- SNSLP - SIGTRAN Signaling Link Print

Status Commands

- STALP - Status Alarm Print
- STRAP - Status Remote Application Server Print
- STBOP - Status Board Print
- STCRP - Status C7 Route Print
- STC7P - Status C7 Link Print
- STDDP - Status Disk Drive Print
- STEPP - Status Ethernet Port Print
- STIPP - Status IP Print
- STLCP - Status Licensing Print
- STPCP - Status PCM Print
- STRDP - Status Remote Data Center Print
- STSLP - Status SIGTRAN Link Print
- STSYP - Status System Print
- STTPP - Network Time Protocol Status Print

Glossary

ASP	Application Server Process. A process instance of an Remote Application Server (RAS). An ASP serves as an active or backup process of an Application Server (for example, part of a distributed virtual switch or database). Examples of ASPs are processes (or process instances) of MGCs, IP SCPs or IP HLRs. An ASP contains an SCTP endpoint and may be configured to process signaling traffic within more than one Application Server.
AIS	Alarm Indication Signal
ANSI	American National Standards Institute
BER	Bit Error Rate
CCITT	Consultative Committee on International Telegraphy and Telephony
CCS	Common Channel Signaling
CIC	Circuit Identification Code
CPU	Central Processing Unit
DC	Direct Current
DSC	Digital Signaling Converter
DSI	Distributed Signaling Interface
DSMI	Dialogic® / Distributed Structured Management Information
DSR	Data Set Ready
DTE	Data Terminal Equipment
DTR	Data Terminal Ready
FTP	File Transfer Protocol
IETF	Internet Engineering Task Force
IP	Internet Protocol
ITU	International Telecommunication Union
LIU	Line Interface Unit
M2PA	MTP 2 Peer to Peer Adaptation Layer
M3UA	MTP3 User Adaptation Layer
MML	Man-Machine Interface Language
MTP	Message Transfer Part (of SS7 signaling)
NTP	Network Time Protocol
PCM	Pulse Code Modulation
PSU	Power Supply Unit
RAS	Remote Application Server. A logical entity serving a specific Routing Key. An example of a RAS is a virtual switch element handling all call processing for a unique range of PSTN trunks, identified by an SS7 SIO/DPC/OPC/CIC_range. Another example is a virtual database element, handling all HLR transactions for a particular SS7 DPC/OPC/SCCP_SSN combination. The RAS contains a set of one or more unique Application Server Processes (ASPs), of which one or more is normally actively processing traffic. Note that there is a 1:1 relationship between an RAS and a Routing Key.
RDC	Remote Data Center
SCTP	Stream Control Transmission Protocol
SGW	Signaling Gateway

SIGTRAN	Signaling Transport
SIU	Signaling Interface Unit
SNMP	Simple Network Management Protocol
SS7	Signaling System Number 7
SSH	Secure Shell
STP	Signaling Transfer Point
SEP	Signaling End Point
SNM	Signaling Network Management
TDM	Time-Division Multiplexing